

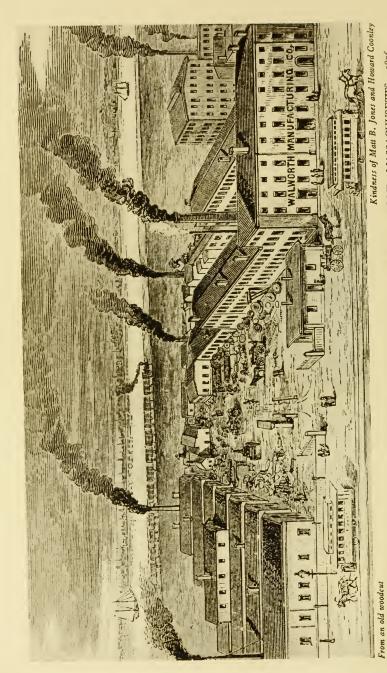
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SOME INDUSTRIES of NEW ENGLAND







PLANT OF THE WALWORTH MANUFACTURING COMPANY IN CAMBRIDGEPORT, MASSACHUSETTS, 1876

The Charles River and the Boston shore can be seen in the background. One end of the telephone wire used by Professor Bell for his first reciprocal open-air conversation was set up in the building in the right-hand foreground, the other end being in the Walworth Company's offices in Kilby Street, Boston.

SOME INDUSTRIES of NEW ENGLAND

Their Origin, Development and Accomplishments, illustrated by many Old and Interesting Views



ISSUED BY THE
STATE STREET TRUST COMPANY
Boston, Massachusetts
1923

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STATE STREET TRUST COMPANY

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FOREWORD

EW ENGLAND has long been known the world over as a manufacturing centre of great importance. From the early days when its vessels took shiploads of cod, pipe staves, lumber and grain to the West Indies, bringing back sugar, molasses, wine, indigo and cotton, through the era when every port of the seven seas knew well the flags of New England's clippers, and up to the day of the spindle and modern turbine, New England has been above all else an industrial section.

Yet those who think there has been no romance in her history have only to scan the records of her varied industries to learn how full of thrilling stories and daring adventures it has been, and how courageous and persistent have been her efforts to develop her industries and to place her products on the markets of the world. The different monographs which the State Street Trust Company has issued for many

years past are full of facts which demonstrate this.

To the imagination, persistence and courage of such men as Nathan Appleton, Patrick Tracy Jackson, Francis Cabot Lowell, Samuel Slater and his father-in-law, Moses Brown, Amos A. Lawrence, David Wilkinson, Joseph Jenks, Eli Whitney and many others, she owes the diversified industries which dot her landscape. Volumes might be written of how her great centres of activity came to be and grew

to their vast proportions of today.

It seems fitting, therefore, to include in our series of brochures one which will tell a little of the early history of the huge industries which have done so much to bring renown to this section of the country. Obviously, in a publication of this nature it is impossible to deal with all of the excellent manufactories which have had a part in the remarkable industrial development of New England, but we have endeavored to select some which have especially interesting histories, or which have shown the most phenomenal growth.

The material used has been chosen on the supposition that the early history of a number of the most prominent companies would prove of wider interest than a more exhaustive treatment of fewer industries since the modern history of most plants is much more easily obtain-

able.

We have been fortunate in obtaining many reproductions of old prints showing original plants. This has been difficult, for, apparently, the hard-headed New Englanders of the early days were so completely occupied in building up their organizations that but few considered it worth while to have prints made of their factories, or interesting incidents recorded, to be preserved for the information of future generations. It has been found necessary to divide the material into two brochures, and as there is still space for more companies in the second of the series, to be issued next year, we suggest that if any officials of the older industries of New England have any old prints and histories of their plants, the Trust Company would be pleased to have these submitted for consideration.

The preparation of this brochure would have been impossible without the friendly co-operation of the following persons, of whose

assistance we are deeply appreciative:

Frederic C. Dumaine, H. E. Melzar, Amoskeag Manufacturing Company; Hendricks H. Whitman, Arlington Mills; J. H. Hustis, F. B. C. Bradlee, Boston and Maine Railroad; John A. Sweetser, Boston Manufacturing Company; Joseph B. Russell, Harold F. Mason, Frank E. Porter, Boston Wharf Company; Spencer Borden, Jr., Fall River Bleachery; Harold C. Keith, Geo. E. Keith Company; Howard S. O. Nichols, Great Falls Manufacturing Company; Matt B. Jones, Harry Bicknell, New England Telephone and Telegraph Company; Arthur E. Mason, E. Benj. Armstrong, Hamilton Woolen Company; Malcolm B. Stone, Albert F. Bigelow, W. G. A. Turner, Ludlow Manufacturing Associates; J. Foster Smith, Naumkeag Steam Cotton Company; Alfred E. Colby, Fessenden S. Blanchard, William G. Smith, Pacific Mills; Walter H. Bradley, Matthew W. Colquhoun, Frank C. Deering and Burton H. Winslow, Pepperell Manufacturing Company; Augustus P. Loring, Francis C. Holmes, J. S. Bradford, Plymouth Cordage Company; Amor Hollingsworth and Arthur V. Howland, Tileston & Hollingsworth Company; H. C. Gallagher, Walter Baker & Co., Ltd.; Ronald T. Lyman, Waltham Bleachery and Dye Works; Howard Coonley, Walworth Manufacturing Company; C. F. Broughton, Wamsutta Mills; and also N. T. Kidder, Miss Jane W. Kennedy of the Milton Historical Society and C. M. Holmes.

We hope that this brochure will be a not unworthy companion to the many others that have been issued during the past seventeen years as the contribution of the State Street Trust Company to New England's history.

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AMOSKEAG FALLS FROM THE AMOSKEAG BRIDGE

Showing the mills of the Amoskeag Manufacturing Company and the city of Manchester, New Hampshire, about 1856.

SOME INDUSTRIES of NEW ENGLAND

AMOSKEAG MANUFACTURING COMPANY

HE first cloth manufactured by power in this country was at the falls of Parker River, in 1794, though the pioneer at Amoskeag, Benjamin Prichard, was only ten years behind those who undertook the work in the Massachusetts parish of Newburyport. While there were a few struggling mills before 1804, it was not until 1810 that the industry of cotton manufacturing in New England can be said to have really entered upon a successful period. In 1812 there were twenty cotton mills in Massachusetts, but it required twenty years more to establish the industry upon what might be considered a firm footing. The textile business of America has expanded to large proportions, employing now more people than any other trade or calling, for including the manufacture of finished clothing it is figured that as many as 1,400,000 wage-

earners are enrolled in its army of workers.

The accounts of the success of a small body of manufacturers at Pawtucket, Rhode Island, of whom Samuel Slater was the leading spirit, reached the interior of the country, whereupon Charles Barrett, a man of considerable wealth living in New Ipswich, New Hampshire, induced Charles Robbins, a machinist in the employ of Mr. Slater, to superintend the building of a mill on the Souhegan River in that town. Mr. Robbins accepted the invitation and employed Prichard, an experienced carpenter, to construct the mill, which was completed and went into operation on December 15, 1804. Immediately upon finishing his work on the New Ipswich mill, Prichard, believing in the manufacture of cotton goods, came to Amoskeag Falls, where he realized he would be able to obtain sufficient water power. He secured the privilege of a saw mill then owned and operated by Jonas Harvey, situated at the Amoskeag Falls just below the entrance to the bridge that spans the Merrimack today. Harvey mentions the sale in these words: "In the summer of 1804 I was living at Amoskeag in Goffstown. I owned a saw mill there standing at the head of the Falls. I let Mr. Benjamin Prichard have the privilege for a cotton mill. He dug a canal in a ledge which passed under the ways of my saw

mill. During the season he put up his mill on a bluff below my saw mill. . . . The fall after, I sold my mill to Capt. Ephraim Stevens and in February, 1805, moved upon the farm where I now live."

Prichard's mill was a small wooden building, as were nearly all of those erected at that period. He seems to have commenced operations in the fall of 1805, so that we may safely say that the manufacture of cotton was begun at Amoskeag almost, if not quite, simultaneously with that at New Ipswich. Prichard had already enlisted the interest of others, and on January 31, 1810, a company was organized under the name of "Proprietors of the Amoskeag Cotton and Wool Manufactory." The hamlet where this new industry was slowly developing belonged then to Goffstown and was not joined

to Manchester until 1853.

Prichard succeeded in enlisting in his enterprise four friends, James Parker and David McQuesten, of Bedford, and Samuel P. Kidder and John Stark, Jr., of Derryfield. This company enlarged the original mill into a wooden building two stories high and fitted it as a cotton manufactory where they immediately began the spinning of cotton yarns. The capital, however, was still inadequate to meet the development of their industry, and in order to raise the necessary funds it was thought wise to petition the state legislature for an act of incorporation, which was granted, under the style of Amoskeag Cotton and Woolen Manufacturing Company, on June 5, 1810. The first directors' meeting was held within a few days, James Parker being chosen President. The trying years after the war of 1812–15 almost prostrated the Company through no fault of its management, but in spite of these conditions these pioneer manufacturers struggled vainly.

It is interesting to note the simplicity and crudeness of the ways and means of this old unpainted wooden mill as compared with modern methods of machinery. At the outset the only machine which had been put into action was the spinning jenny, invented by Hargreaves and first operated in England in 1767. This was considered a wonderful invention, as by means of eight spindles set in a frame as many threads could be spun, while previously it had been possible to spin only a single thread. Some spinning frames today have over three hundred spindles. Prichard soon employed an expert machinist of Smithfield, Rhode Island, called Preserved Robinson, to build an Arkwright Spinning Frame. This was a recent invention of spinning by rollers, and the one built at Amoskeag was the first made in the State, probably the first in operation in New Hampshire. Another invention was made by John Kay, when he patented in 1773 a fly shuttle, by the operation of which the weaver sits in the middle of the loom, and pulls a small cord, which casts the shuttle from side to side.

Early in the year 1822, one of the directors of the Company wrote to Samuel Slater of Providence, Rhode Island, for a loan of money to be secured by a mortgage upon the mill property. Slater was so impressed with the account of the opportunity for manufacturing operations at Amoskeag, that the following summer he made a trip

SOME INDUSTRIES OF NEW ENGLAND



From an old print

Kindness of Frederic C. Dumaine

STEAM FIRE ENGINE AMOSKEAG NO. 1

Besides the manufacture of woolen and cotton goods, the Amoskeag Manufacturing Company made some of the finest engines ever built. This is a view of the steam fire engine Amoskeag No. 1, built in 1859.

in his top carriage to the place, calling on his way at the mill of Kirk Boott, then a noted manufacturer in New England, whom he found in East Chelmsford superintending a gang of laborers at work excavating for the foundation of the first Merrimack Mill. The keen judgment of Mr. Slater quickly foresaw the possibility of success at Amoskeag Falls, whereupon he went home to encourage a man in his employ, Olney Robinson, to buy the mill and privilege. Slater loaned Robinson between four and five thousand dollars towards making the purchase, and on October 22, 1822, the property passed from the possession of a corporation into the hands of this individual.

Mr. Robinson was a native of Attleboro, Massachusetts, and though he had had but little experience as a manufacturer of cotton goods, he was something of a mill man. While possessed with unbounded enthusiasm, yet the men most interested in his efforts, the mortgagors, soon realized that he was not likely to be successful, and on January 24, 1825, within three months of making the loan, they foreclosed the mortgage, coming into possession of one-half of the mills and machinery. On May 6 of the same year, Slater paid Robinson



From an old drawing

Kindness of Frederic C. Dumaine

VIEW OF THE OLD MANCHESTER MILL OF THE AMOSKEAG MANUFACTURING COMPANY AT MANCHESTER, NEW HAMPSHIRE

\$3,000 for the other half. The three new owners, Pitcher, Gay and Slater, with years of experience, then decided to enlarge the plant by finishing the second mill and by building another on the island, and in order to do this they interested other persons in the enterprise, the new members of the company being Dr. Oliver Dean, of Medway, Lyman Tiffany, of Salisbury, and Willard Sayles, of Boston. This organization was completed in 1825. Oliver Dean was chosen agent, and the title of the new firm became the Amoskeag Manufacturing Company; and from the formation of this company, known throughout the world, begins an unbroken story of the rise and progress of manufacture at Amoskeag Falls.

Little seems to have been done by the new company during the winter, but in April of the following year active operations were begun. Dean was re-elected Agent and Lyman Tiffany was made President, while the Board of Directors was composed of Slater, Sayles, Pitcher

and Gav.

The Old Mill which Robinson had repaired was fitted with improved machinery, so it soon became a scene of activity. The new building was known as the "Bell Mill" on account of the bell which hung in its belfry, rung to call the operatives to work in the early morning, and to warn them at nine o'clock in the evening to discard the cares

of the day.

The Island Mill, so called for reasons that must be obvious, stood upon that historic spot of land dividing the river below the Falls. Before the advent of the white man it was a great fishing place for the Indians, and when they were finally deprived of their rights elsewhere the island was allowed them as their heritage. Hither they and their descendants were in the habit of coming annually for a long period and then more irregularly until their last journey was made in 1848. During one of their visits, in the heyday of manufacture there, a young Indian couple were married on the isle, the ceremony forming a pic-

turesque contrast to the more modern business life of the mill. In those days the country traffic was wholly carried on by boats that plied on the Merrimack between Amoskeag and Boston via the Middlesex Canal, or by the heavy, canvas-covered wagons moved by slow-going ox teams. Stage lines ran daily through the place, stopping for dinner and to exchange passengers at Amoskeag Inn, thus keeping the little manufacturing hamlet in touch with the world.

In these early years, as explained in the booklet of the Company, "yarn was spun by hand and its neat skeins were the common currency of trade. Operatives at one time were paid with it, the grocer received it for his goods, the landlord for his rentals, the promoters of the industry got it for remuneration for their services, and even the grizzled old stager, Robbins, who was a familiar figure in those days and scenes, took it as fare, finding easy disposal of it as soon as he had passed beyond the radius of its manufacture. So yarn was legal tender everywhere, and no one was the poorer."

In 1831 a meeting of the six owners of the mills, Ira Gay, Oliver Dean, Willard Sayles, Lyman Tiffany and Larned Pitcher, the latter also acting as attorney for Samuel Slater, was held in the counting room of the Beel Mill, and a petition was drafted asking the state legislature then in session the power and protection to raise \$1,000,000, an almost fabulous sum for those days, with which to develop the business they had planned to execute. Again the state legislature looked with favor upon the request of the struggling manufacturers, and "The Amoskeag Manufacturing Company" was incorporated according to the laws of the State of New Hampshire on July 1, 1831, with an authorized capital of \$1,000,000. Lyman Tiffany was chosen the first President, Oliver Dean, Treasurer and Agent, Lyman Tiffany, Ira Gay and Willard Sayles, Directors.

In the next few years the Company obtained possession of the Hooksett Company, the Union Locks and Canal Company in control at Amoskeag Falls, the Isle of Hooksett Canal Company, the Bow Canal Company, and the Concord Manufacturing Company, owning over a thousand acres of land and controlling the power at Garvin's Falls. In May, 1892, The Amoskeag Manufacturing Company disposed of the land about Garvin's Falls and the water rights which they had purchased of the Concord Manufacturing Company, to William A. Russell, of Boston, trustee for the Garvin's Falls Power

Company.

At the annual meeting in July, 1837, William Amory, of Boston, was chosen President, holding the office for thirty-nine years, and at about this time certain men, most of whom had interests in The Amoskeag Manufacturing Company, incorporated the Stark Manufacturing

Company, so called in honor of General John Stark.

The Mills of the Company, however, did not long enjoy the distinction of being the only attraction in Amoskeag for pleasure-seekers, for early in the year 1838 the Company built a town upon paper, surveys were made, streets laid out and house lots plotted.

Several years later The Amoskeag Manufacturing Company began

the construction of two mills on the east bank of the river, a fact that brought forth these lines entitled "Amoskeag's New Mill":—

Hurrah! hurrah! the work is done; We've met here with good will, To eat, to toast, to celebrate The Amoskeag New Mill.

The mighty cars will roll along
Beside the great canal,
Where on one side the factories stand—
The other side we dwell.
We'll step into her lofty train—
To Boston city go—
Can dine and do our business up
And back before you know.

January 24, 1842, the Company originated the first banking system in the town, when it arranged to receive the funds of its employees as far as they wished. This was done for the accommodation of those who desired some safe place of deposit for their surplus earnings. This plan was continued until 1856 and then abolished, as regular banks

had then been organized.

In 1848 each mill had its own repair department, and when the New Foundry was built and equipped, an order came from the Northern Railroad for a locomotive which was named the Etna, the first one made for that road. In 1859, after having made two hundred and thirty-two engines, the Company sold the interest in this work to the Manchester Locomotive Works. The Company also made fire engines. The city of Manchester was induced to give The Amoskeag Manufacturing Company an order for one of these machines, and this was made in time for the Company to exhibit at the firemen's muster in 1859. One of their engines of this style was sent to Boston during the great fire in 1872, and did most excellent work; in fact, it is claimed that the conflagration was kept from crossing Washington Street largely through the efficient work of this engine. Through its machine shops The Amoskeag Manufacturing Company was enabled to keep its older men at work during the war, turning out a lot of Springfield rifles.

On December 12, 1905, the Company purchased the Amory Manufacturing Company, named in honor of William Amory, one of the pioneers in cotton manufacturing in New England, thus placing The Amoskeag Manufacturing Company in possession of all the cotton manufacturing plants of Manchester, with the exception of the Stark Mills. We have hastily sketched the unbroken growth of the great enterprise founded by the half-dozen sanguine projectors, who held their first meeting in the dingy counting-room of the Old Bell Mill on the evening of July 13, 1831. Its plant now stretches along the east bank of the Merrimack for nearly two miles, and spans the river by its own bridges. Other factories already occupy the

slopes on the west bank.

At the World's Fair held in London in 1851, the corporation sent specimens of its fabrics, flannels, sheetings, tickings and denims to the leading commercial mart of Great Britain, and much to the surprise of the Old World manufacturers, the award of the first and only

prize was given to The Amoskeag Manufacturing Company.

At least fourteen of the Presidents of the United States have visited or been in the State of New Hampshire during their terms of office and most of them have not left the town without visiting the Amoskeag Mills. The most noteworthy of all was Lincoln, who came to Manchester as the invited guest of Hon. E. A. Straw during the campaign of 1860, just previous to his election as President of the United States. He accepted an invitation to visit the mills, and Agent Straw then sent for a young machinist to escort his illustrious guest through the various departments. The young man ordered to do this, without any premonition of what was to follow, was Edwin P. Richardson, and his own words best tell the rest of the story: "Thinking I was simply wanted to make some repairs about the machinery, I did not take the trouble to change my clothes or even to wash my begrimed face and hands. Judge, then, of my surprise upon entering the private office, of seeing an extremely tall and rugged man standing before me, the very speaker I had listened to the evening before with so much interest. Mr. Straw introduced him to me, but when Mr. Lincoln held out one of his great hands to clasp mine, I shrank back, saying in a tone that I know could not have been entirely free from tremor: 'My hands are hardly fit to take yours, Mr. Lincoln, so'- 'Young man, the hand of honest toil is never too grimy for Abe Lincoln to clasp.' You may rest assured it was a good, long, hearty grip that he gave me."

President Ulysses S. Grant passed through the State in the summer of 1869, not failing to examine those industries which have been the source of Manchester's growth and prosperity. The illustrious visitor and his suite, accompanied by Mayor Smith, Ex-Governor Smyth, William Amory, Treasurer, E. A. Straw and others, passed through the yards of the Manchester, Amoskeag and Stark mills. President Theodore Roosevelt, on August 22, 1902, gave "forty

President Theodore Roosevelt, on August 22, 1902, gave "forty minutes," which was lengthened to one hour, to a visit to Manchester. His suite was taken about the city in the vicinity of the mills, while the Amoskeag band joined in welcoming the visitors. President Taft also paid a visit to Manchester and the Amoskeag Mills.

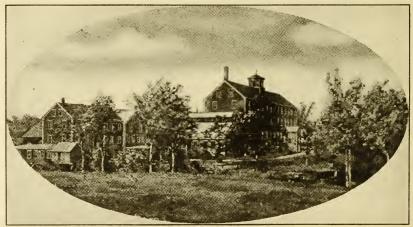
Other names are especially conspicuous on the Amoskeag roll of honor: Dr. Oliver Dean, the leader of the little group of founders; William Amory, for nearly forty years the treasurer of the company, and his son Charles W. Amory; Governor Ezekiel A. Straw, for over forty years the agent and local manager; Benjamin Prichard, the first man in New Hampshire to undertake cotton manufacturing on his own responsibility, T. Jefferson Coolidge, and F. C. Dumaine, the present efficient head.

ARLINGTON MILLS

The first Arlington Mill, shown in the accompanying illustration, was built on the Spicket (Spiggot) River in Lawrence, Massachusetts, and in 1865 became the property of the company known as the Arlington Mills. It is interesting to note that before that time it belonged to Abiel Stevens, who made there the black-walnut cases for the famous Chickering pianos, the pianofortes themselves being made in Jamaica Plain, to which place the cases were trucked over the road from Lawrence.

This original building was burned in 1866, and in 1867 a second mill was erected; since then the plant has grown steadily until now the buildings contain over fifty-four acres of floor space, and employment is given to seven thousand people. In place of the original 60 H.P. water-wheel the power plant now contains steamdriven turbo-electric generators with a capacity of 32,000 H.P. When the company was incorporated its capital was \$150,000, and this has been increased during the past fifty-eight years, until it is now \$12,000,000. The company had a hard struggle in its early days, and in the 70's had to reduce its capital stock and have new stock issued, and on one occasion its entire capital of \$240,000 was wiped out and the full amount paid in again in cash. This shows the courage of the founders of the corporation and gives some idea of the difficulties which faced the pioneers who introduced the manufacture of worsted goods into this country in competition with the old established industries in England and on the Continent.

The Arlington Mills is now one of the largest worsted mills in the world and produces worsted fabrics for both men's and women's use.



From a photograph

Kindness of Hendricks H. Whitman

VIEW OF THE FIRST ARLINGTON MILLS

Built on the Spicket (Spiggot) River, Lawrence, Massachusetts, in 1865.

SOME INDUSTRIES OF NEW ENGLAND



From a photograph

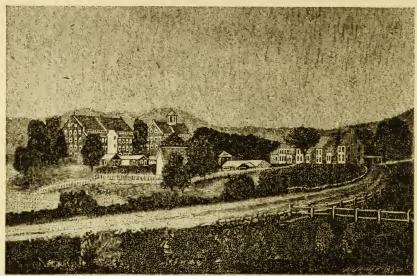
Kindness of Hendricks H. Whitman

THE SECOND ARLINGTON MILLS, LAWRENCE, MASSACHUSETTS, TAKEN ABOUT 1867

The main plant is located in Lawrence and Methuen, but there is also a branch at North Adams, Massachusetts. The Combing Plant at Lawrence can consume the fleeces of thirty-three thousand sheep per day, and the mills produce over four hundred thousand yards of worsted cloth per week. The company owns and controls water privileges and reservoirs covering over one thousand acres in New Hampshire in order to insure a full and constant supply of water which is so essential for its dyehouse and the proper finishing of its goods. The corporation has paid regular dividends since 1877 without a break, with the exception of one semi-annual dividend, and during the past twelve years it has paid out \$8,720,000 in cash dividends, an average of eight and two-tenths per cent. on its capital stock.

BOSTON MANUFACTURING COMPANY

In 1813 the first steps were taken towards the establishment of a cotton mill on the Charles River at Waltham, Massachusetts. The enterprise grew out of a visit made by Francis Cabot Lowell to Scotland and England in the years 1811–12, where he made a careful study of the power loom, which at that time was in operation in Great Britain weaving cotton cloth under patents taken out by the Rev. Edmund Cartwright. While in Edinburgh, Lowell met his friend, the Hon. Nathan Appleton, of Boston, and the two men agreed to co-operate



From an oil painting

Kindness of John A. Sweetser

BOSTON MANUFACTURING COMPANY'S COTTON MILLS AT WALTHAM, MASSACHUSETTS, IN 1820

The building on the left was built in 1813 for the manufacture of cotton cloth. Here the successful use of the power loom, the spinning frame and all the operation for converting raw cotton into printed cloth were for the first time introduced into this country and probably in the world. The second building was built in 1816. The space between the two mills was covered in 1845. The first dam across the Charles River was built by Theodore Lyman in 1794 of wood to furnish power for a paper mill owned by John Boyse (or Boise), who sold the same to the Boston Manufacturing Company.

in an effort to introduce into Massachusetts the latest machinery for weaving cotton cloth, as based upon the Cartwright power-loom. Mr. Lowell visited the mills at Edinburgh and Manchester, and on his return to Boston in 1813, after consulting with his brother-in-law, Patrick T. Jackson, they purchased the John Boise paper mill with its water power, at Waltham, and obtained an act of incorporation under the laws of Massachusetts with a capital of \$400,000, of which at first \$100,000 was to be paid in. This sum was supplied by these well-known Boston names: Francis C. Lowell, P. T. Jackson, Charles Jackson, Christopher Gore, Israel Thorndike, I. Thorndike, Jr., Nathan Appleton, Benjamin Gorham, Warren Dutton, James Lloyd and James Jackson. Paul Moody, of Amesbury, Massachusetts, a skilled mechanic, who had run a cotton-spinning mill in that place in partner-ship with Ezra Worthen for fourteen years, was employed to build the machinery and start the mill.

Up to this time the operation of carding and spinning cotton had been carried on with greater or less success in both Massachusetts and Rhode Island, and the product of such carding and spinning had been woven into cloth, but only on hand looms, the shuttles being thrown by the hand of the weaver. The mill of the Cabots at Beverly had not only carding and spinning machinery, but a few looms in the same building, according to the diary of President Washington, who visited the mill October 30, 1789. The power was furnished by two powerful horses working in a sweep in the basement of the mill, but the looms were hand looms though with an improved method of throwing the shuttle by hand that gave greater speed to the movements of the shuttle.

It fell to the credit of Francis Cabot Lowell to introduce the power loom into this country in 1813. He employed several months in constructing it, and it was not before the autumn of 1814 that the perfected machine was put into practical operation in the new mill at Waltham, and not until February 23, 1814, that it was patented by Lowell and Jackson as joint inventors. The product of the loom was first sold by a Mrs. Bowers, and the first sales are not recorded, as the early books of account appear to have been lost. The first entry preserved is dated August, 1815: "Cash received of Isaac Bowers for sale of cloth sent him to sell 14th of May, \$108.46." September 2: "I. Bowers for sale of yarn and cloth \$179.38."

The Boston Manufacturing Company then built a spinning mill of 1,700 spindles. The success of the first loom encouraged the original investors in the enterprise and the entire \$400,000 capital was consequently paid in and the capital stock increased to \$600,000 in order to purchase the "lower place," which became known as the Bleachery. The average weekly pay-roll of the Boston Manufacturing Company in 1815 was about \$115. The neighborhood not furnishing sufficient help to work in the mills, girls were brought from Newburyport to Waltham in these early days. In the year 1818 a schoolhouse was

established and a savings bank was started by the Company.

The inventive genius of Francis C. Lowell and of Paul Moody was largely in evidence in the improved machinery introduced during the early days, and of the former, A. M. Goodale, formerly agent and treasurer of the Company, says: "He created a loom largely from his own designs, a loom that took the yarn already spun and made perfect cloth. To be sure, the cloth was coarse, but it filled its place, and the same kind of cloth is largely made today. He took the rude, imperfect, preparatory machinery and to a great extent improved it. His mathematical calculations on the double-speeder, so called, compelled the admiration of Dr. Nathaniel Bowditch, the eminent mathematician, who remarked, when a witness in a suit brought for the infringement of this motion, that there were certain corrections in the calculations that he had not supposed were known to any one in America save himself."

The following have been treasurers of the Company: Patrick T. Jackson, resigned in 1827, when J. A. Lowell was chosen; then followed John Pickering Putnam, Dr. Ebenezer Hobbs, Jr., T. Jefferson Coolidge, George Atkinson, Edmund Dwight and A. M. Goodale. James Lloyd was the first president and Patrick T. Jackson the first agent. Recently Ronald T. Lyman was treasurer, and today J. A. Sweetser serves in this capacity. The manufacture of hosiery was



From an old print

Kindness of F. B. C. Bradlee and J. H. Hustis

Original train on the Boston and Lowell Railroad (now a part of the Boston and Maine System).

begun in 1868 under the management of George Atkinson, and was continued for some years, finally giving way to the manufacture of gauze, balbriggan, fancy and fast black underwear. The mill now manufactures fine combed yarn, ginghams, tissues, etc.

In 1901 the property of the Boston Manufacturing Company was divided between the newly incorporated Waltham Bleachery and Dye

Works and the Boston Manufacturing Company.

BOSTON AND MAINE RAILROAD

The Boston and Maine Railroad operates 2,516 miles of line, which carries it into a portion of five States as well as a short distance into the Dominion of Canada. The system is the resultant consolidation with more than a hundred and seventy individual corporations dating from the earliest days of the development of New England. The oldest corporation which is included in the present group is that known as The Connecticut River Bridge Company, this charter being granted in 1796 for the bridge over the Connecticut River at Holyoke. Another of the oldest of the corporations is that of The Portsmouth Bridge, which was formed in 1821 to build the bridge between Portsmouth and Kittery. The Boston and Lowell, another

of the group, operated its first train from Boston to Lowell in 1835, placing itself in the front rank of those who participated in opening the present era of transportation in this country. Included in the system also is that historical structure, the Hoosac Tunnel, which was opened July 1, 1876; it is 25,000 feet long, and the story of its construction is one of the engineering romances of New England. During the year as many as thirty millions of people pass through the terminal of the Boston and Maine in Boston.

BOSTON WHARF COMPANY

The original proprietors of the Boston Wharf Company were Cyrus Alger, Hall J. How and Josiah Dunham. After them, and still in the memory of some of the present Board of Directors, came Joseph Ballister, Elisha Atkins, Isaac Farnsworth, and a little later, Charles Theodore Russell, Joseph W. Clark, Jacob Sleeper, Samuel W. Bates, Henry F. Durant and other noted merchants and business men of Boston. The latter was the founder of Wellesley College, and Jacob Sleeper was largely interested in and President of Boston University, to which he gave the Jacob Sleeper Hall.

The present Treasurer of the Company, Joseph Ballister Russell, was elected a director in 1882, becoming Treasurer and executive officer of the Company four years later. At the time of his election, his father, Charles Theodore Russell, was President of the Company, and before him, for many years, his grandfather, Joseph Ballister, was a director of the Company, so that for three generations the Treasurer's family has been largely interested in the welfare and

development of the property.

The Boston Wharf Company was chartered under a Special Act of the Massachusetts Legislature in 1836, coming into existence through the pooling of the riparian rights of many large land owners in South Boston, which rights were largely entended through successive grants from the Massachusetts Legislature which were bitterly contested at the time, and finally and conclusively settled by decree of the Massachusetts Supreme Court. Originally all of its property was under water. The land was filled in gradually, being completed after the Great Fire of 1872, at which time the premises were thrown open to receive the débris from the fire. This event acquired for the property the sobriquet of the "Dump," which stuck to it for a good many years afterwards. As the lands were filled, wharves and sheds were built for the receipt and storage of sugar and molasses, and for many years this was a prosperous business. About the year 1870, Mr. Russell counted as many as sixty-four brigs and schooners tied up at the wharves, which made an attractive picture. These small vessels, now practically unknown, then had regular and paying business in carrying salted fish from the Maritime Provinces to the West India Islands, returning to Boston with sugar and molasses, then loading salt for return trip to the Provinces. The organization of the so-called Sugar Trust and changes in the tariff eliminated the differentials



From a photograph by Frank E. Porter

EXTERIOR VIEW OF THE BROTHERHOOD BASEBALL CLUB GROUNDS

Built about 1892 on land owned by the Boston Wharf Company, the site of the present buildings numbering 364 to 382 Congress Street, and lying between Pittsburgh Street and the railroad yards. It was on these grounds that the famous Mike Kelly used to play ball. In the foreground can be seen empty sugar-bags which were often spread out there to dry in the sun after being washed.

previously allowed to molasses and entirely destroyed this business. For some years thereafter the Company had pretty hard sledding. As many as 20,000 hogsheads of molasses were stored on the property at one time. One of the officers used to relate that on hot days the fire engines came and played cold water on the molasses hogsheads to keep them from exploding. Most of the old-time merchants, who in those bygone days perambulated around in their chaises, would drop over to the wharves to allow their nags to lap up the molasses overflowing through the bungholes which were left open on warm days to prevent the hogsheads from bursting. It was supposed that nothing was so effective to give the horses sleek and shiny coats.

Dividends were maintained until 1877, shortly before the sugar combination made its appearance, when they were suspended. For this and other reasons the future of the Boston Wharf Company appeared gloomy, but in 1882, new and younger men were brought into the management, including Joseph B. Russell, the present Treasurer, and more recently still, his son-in-law, Harold F. Mason, and others. A complete reversal of the policy of the Company became necessary about the year 1882, resulting in the virtual abandonment of the wharfage and storage part of the business,



From a photograph by Frank E. Porter

VIEW OF THE OLD NEW ENGLAND RAILROAD BRIDGE OVER FORT POINT CHANNEL

that there were as many as 20,000 barrels lying on the wharves, and on hot days the firemen used to come and play cold water on the barrels to keep the right end of the bridge. As many as sixty-four sailing vessels have been seen in the early days tied up to the wharves of this Company. Most of these ships had brought sugar and molasses, there being two large (molasses) distilleries here at that time, carrying on a very large business. It is said The site of the present Summer Street bridge, taken about 1893 from the top of building at 303 Congress Street looking southeast. The property across Fort Point Channel (in middle background) is part of the property of the Boston Wharf Company. The site of the present South Station is at them troin exploding.

and in the systematic and thorough development of the property

as a real estate proposition.

For the last thirty-six years the Boston Wharf Company has enjoyed prosperity and steady growth and has maintained an unbroken dividend record which has entirely justified this change in policy. The increase in the rent roll of the Company, from \$2,500 in 1885 to \$750,000 in 1922, as well as the increase in population in its vicinity, from some two or three hundred persons in 1885 to over ten thousand in 1922, indicates the nature of its growth. In 1885 there was nothing on the property but the sugar sheds, while today there are nearly one hundred modern buildings of heavy construction, on some forty-five acres of the Company's land, and there is much land still to be developed. The buildings on the Boston Wharf property are laid out on streets and passageways containing spur tracks and are all leased on long terms to excellent tenants, some of the earliest being C. L. Hauthaway & Sons, Lombard & Co., F. S. Webster & Co., American Radiator Co., Brown, Durrell Co., Pittsburgh Plate Glass Co., National Lead Co., Jones, McDuffee & Stratton, most of whom are tenants today. The earliest tenant was the well-known firm of C. L. Hauthaway & Sons, which was established in its present home as early as 1887. Later lessees include the Ginter Co., Dwinell-Wright Co., John T. Connor Company, Cudahy Packing Co., Corn Products Co., New England Confectionery Co., Armour Leather Co., Howes Bros., George E. Keith Company, U. S. Leather Co., Crucible Steel Co., Fairbanks Co., A. C. Harvey Co., Edgar T. Ward's Sons Co., American Can Co., J. I. Case Threshing Machine Co., General Electric Co., Westinghouse Electric & Manufacturing Co., U. S. Radiator Corporation, and others too numerous to mention.

One of the earliest tenants, near the site of the present Stillings Building on Congress Street, was the Boston Brotherhood Baseball Club, which went over there in 1891 and established what at the time was considered the best baseball park in America. The Club was backed by substantial people and had among its players the famous Mike Kelly, and the delightful John Morrill, who devoted his life to manly sports and through his firm of Wright & Ditson has done much to encourage them. An illustration shows the grounds at that time.

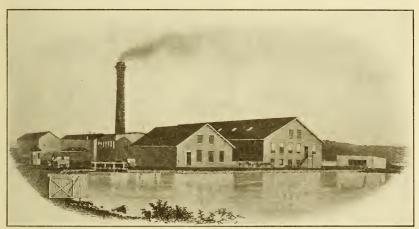
Running through the property is Summer Street, a wide and most up-to-date thoroughfare, which today is the centre of the wool business, the largest in this country, and substantially on a par with the largest in the world. Other industries, such as leather, candy, shoe and glass factories, paper, printing, and paint, are also associated with this new remarkable development. While not a manufacturing company, we have included it on account of its being one of our most successful real estate companies, and also owing to the fact that it is a landlord of so many important companies and firms.

THE FALL RIVER BLEACHERY

The Fall River Bleachery was organized in 1872 by Spencer Borden, who acted as Treasurer and General Manager. He continued in this capacity until 1899, when he became President, which office he held until his death in 1921. Spencer Borden, Jr., became Treasurer and

General Manager in 1899.

The original capitalization was \$250,000. In 1888 a stock dividend was declared making the capital \$400,000. This was increased to \$600,000 by another stock dividend in 1899 and again in 1920 to \$1,500,000, the present capitalization. The business of the Company is bleaching, dyeing and mercerizing of cotton fabrics, and the plant has been kept up to date and modern in every way.



From an old print

Kindness of Spencer Borden, Jr.

FALL RIVER BLEACHERY, FALL RIVER, MASSACHUSETTS, IN 1872

GEO. E. KEITH COMPANY

The above inscription is placed on the original building where Franklin Keith and his wife made the first shoes turned out by this well-known family in Brockton, the forerunners of the many thousands of pairs of the Company's shoes that have gone to many corners of the world. His descendant, George E. Keith, founder of the Geo. E. Keith Company, worked outside of school hours in the shops of his uncle and father, being employed later by the former as a cutter. On July 1, 1874, at the age of twenty-one he left his uncle's employ and began business for himself with a capital of \$1,000, his total savings up to that time.

For the first year ten men were employed, and the total value of the output amounted only to about \$20,000, which was rapidly disposed of to jobbers. When business was quiet it is said that Mr. Keith



From a photograph

Kindness of Harold C. Keith

THE PIONEER OF THE PRESENT GEO. E. KEITH FACTORIES

Shop where Franklin Keith and his wife, parents of George E. Keith, D. Cary Keith and Myron L. Keith, made, stitched and pegged shoes for fifteen years. The insert in the lower right-hand corner is the original section of No. 1 factory, erected by George E. Keith in 1870.

would pack up a few samples and start for some city where he thought there was a prospect of securing business. In this way he became intimately associated with many of his customers, and thus were planted the seeds of an understanding of one another's problems which was so mutually advantageous. This personal contact accounts to a large degree for the rare loyalty to Mr. Keith personally and to his later associates which has always been a distinguishing characteristic of the Geo. E. Keith Company.

The first great turning-point in Mr. Keith's career came when he decided to sell his product solely to retailers, no longer manufacturing shoes for the wholesaler or jobber; the response from the retail trade was immediate. His first factory with a daily capacity of twelve hundred pairs was erected in 1879, and in 1896 he took into partnership with him his brothers D. Cary Keith and Myron L. Keith, and Oscar C. Davis, the firm being then incorporated under the name of Geo. E. Keith Company.

In 1898 Mr. Keith and his associates adopted the Walk-Over trademark for their product, and today the shoe and leather trade papers state that "Walk-Over" is the most valuable shoe trade-mark in the world.

George E. Keith was the pioneer American shoemaker in foreign markets, for it was more than thirty-five years ago that his shoes were first sold abroad, and in January, 1900, he opened a Walk-Over store in London, the first exclusive American shoe store in Europe. From this beginning grew the great chain of Walk-Over stores and agencies throughout the world. To meet the demand for this product it was necessary to build nine big factories, which are located at Campello, Middleboro, North Adams, East Weymouth, Boston, Massachusetts, and Rochester, New York, having a combined floor space of 26.8 acres and a daily capacity of 11,000 pairs of men's and 12,000 pairs of women's shoes. At Campello, also, is the Walk-Over Club House and Athletic Field, one of the finest in New England, which Mr. Keith and his associates presented to Walk-Over employees on July 1, 1914, on the occasion of his fortieth anniversary in business.

George E. Keith lived to see the business grow beyond his fondest hopes. His two sons, the late Eldon B. Keith and Harold C. Keith. became directors and officers of the Company, and with other valued associates the latter has continued the excellent high standard set

by his predecessors.

GREAT FALLS MANUFACTURING COMPANY

The early history of the Great Falls Manufacturing Company as told by Mr. H. S. O. Nichols, the present Treasurer, gives us an excellent idea of the manner in which New Hampshire Mills handled their business. Of course there were no railroads in those early days of the Company, which made it necessary to get their cotton goods by ox team to the river and then to transport them down river in scows to Portsmouth, whence shipment was made by sailing vessel. This plant, which is at Somersworth, New Hampshire, is one of the oldest textile mills in the country, its history dating back to the year 1821, when Isaac Wendell purchased the water privileges at Great Falls and with it the land on both sides of Salmon Falls River for the

sum of \$5,000, with a view of establishing cotton mills.
In June, two years later, the Great Falls Manufacturing Company was incorporated, and by January of the following year 1,280 spindles were completed, with all other-necessary machinery for manufacturing cotton goods, at a cost of \$25 per spindle, and later in the year four thousand spindles were added. The stone for the buildings was quarried near the site, and the bricks were made on the ground. In 1825 a woolen mill was built at the upper dam to produce two hundred yards daily of fine broadcloths, with carpet making as a side line. The capital was increased the next year to \$1,000,000, and the two lower sections of present Mill No. 2 were erected. Part of a building erected was used for several years as a place of Congregational worship. The manufacture of woolen goods was discontinued in 1834. Business increased steadily until in 1883 the equipment amounted to 112,000 spindles and 2,756 looms, which turned out 23,000,000 yards of cloth per annum. The bleachery was started about the year 1851 and



From an old photograph

Kindness of Howard S. O. Nichols

EARLY MILLS OF THE GREAT FALLS MANUFACTURING COMPANY AT SOMERSWORTH, NEW HAMPSHIRE

The stone for the buildings was quarried near the site, and the brick made on the ground.

has grown to a present capacity of a million yards of cloth per week, the average being about 700,000 yards.

The Great Falls Manufacturing Company is the principal business interest in the town of Somersworth, and has always contributed

generously to the welfare of the community.

In 1920 the new buildings of the Company were built by Lockwood, Greene & Co., and the firm's engineers have written such a complete description of the property in the magazine called *Builders*, published by the above firm, that the editor of this paper stated that the Company's buildings "haven't any more privacy than Irvin Cobb's famous goldfish in a show window on Fifth Avenue."

One of the most interesting incidents connected with the Company was the discovery of a poster on a rafter of the machine shop, when it was torn down in 1920 to make room for the new mill. This poster called a meeting of the citizens of Great Falls, the old name for Somersworth, to take action on the death of Daniel Webster. The old poster could not be removed, on account of its age, and therefore the beam to which it was attached was sawed off and this relic preserved in the Somersworth office. It reads as follows:—

PUBLIC MEETING At the request of many citizens of Gt. Falls the Public Generally are requested to meet in the Union Hall This

SOME INDUSTRIES OF NEW ENGLAND

(Wednesday) evening at 8 o'clock to determine upon some proper proceedings in testimony of our respect for the memory of the late DANIEL WEBSTER

October 27, 1852

HAMILTON WOOLEN COMPANY

The Hamilton Woolen Company of Southbridge, Massachusetts, is the outgrowth of several early manufacturing activities at a point on the Quinebaug River selected by the pioneers of that section for its water power, which proved to be exceptionally uniform throughout

the year.

As early as 1812 James Walcott began there the manufacture of cotton yarn. Two years later the Globe Manufacturing Company was incorporated and the section of the town which grew up about the mills has ever since been called Globe Village. The building then erected, called one of the largest mill buildings in the country, shown in the accompanying illustration, is used today as a carpenter shop

by the Hamilton Woolen Company.

This venture proving unprofitable, as a result of the depression following the War, Mr. Walcott turned his energies to the manufacture of woolen fabrics. Plenty of raw material was available close at hand, heretofore made into cloth in the homes by the crude hand processes of early days, and the new enterprise showed sturdy growth. The Globe Company was acquired in 1819 and it is interesting to note that three years later the capital was increased and divided into twenty-four shares of \$3,000 each, held by six stockholders. Power looms were installed shortly after, against the vigorous opposition of the weavers, who saw in the innovation the loss of their positions and the prestige as skilled craftsmen which they held in the community.

The industry flourished and James Walcott had apparently laid

The industry flourished and James Walcott had apparently laid the foundations for a success which would have marked him as a notable figure in the industrial life of his time, when the fruits of his efforts were literally washed away in the spring freshet of 1828 which burst a newly constructed dam and caused such havoc as to cripple the enterprise permanently. After a few years of struggle the Hamilton Woolen Company took over the property, incorporating in the year 1831. Under the able direction of Samuel Hitchcock, the first agent, affairs were straightened out and prosperity restored. A large brick mill and tenement houses still in use were erected in 1836.

The employees of the early days were native stock, and work in the mills alternated with farm occupations, as is well illustrated by the

following note addressed to Mr. Walcott in 1829:-

"Sir: I want to know whether you will let me have another web at the same price as I have been weaving. I think it would be no more than just considering I have taken so much at the store and the disadvantage it will be to me on account of my garden and I have a pasture for my cow and if I should go away now I could not get more than fourteen dollars for her, and if I can stay and fat her she will



From an old painting

Kindness of Arthur E. Mason

VIEW OF GLOBE VILLAGE IN 1822

The building in the centre, situated on the banks of the Quinebaug River, is that of the old Globe Manufacturing Company, the forerunner of the Hamilton Woolen Company.

fetch me thirty and if you can't let me have another I must weave the cutt I have in the loom, and go out to having and weave the remainder when I come back. Please send me an answer by Mr. Chamberlain.

WM. JORDAN."

The hours of labor in those days, like those on the farm, were from dawn to dark, with time allowed for breakfast, dinner and supper, except that in winter breakfast was later before going into the mill. Wages were paid by the year. All trading was at the company store, purchases of employees being charged against their wages. At the end of the year a balance was struck, and oftentimes the employee was found to be actually in debt to the Company. Money as a medium of exchange was almost non-existent, and among themselves the people were forced to resort to the primitive methods of barter.

Up to 1844 Hamilton made only fine broadcloths and similar fabrics, but about this time Mr. Joshua Ballard was employed to install the manufacture of "muslin delaine," a fabric requiring a cotton warp and a worsted filling. A new building was constructed in which to produce the cotton warp. The manufacture of the worsted yarn had but recently been introduced from England, and Mr. Ballard was one of the few men in the country competent to lay it out, training the native American worker in the new departure. At first much secrecy shrouded their methods, and the worsted workers considered themselves superior to the lowly woolen workers.

The versatility required of the manager of a manufacturing enterprise of this period is interesting to note, for not only was Mr. Ballard the mechanic in laying out his machinery, but he took trips to England in sailing craft to purchase it. He was also his own surveyor in planning water power and mill developments, serving as draftsman as well as supervisor of construction, even drawing up his own deeds of transfer.

Occasionally disaster marked the path of progress, for in 1850 fire destroyed all but the large walls of the building known as the "Big Mill." Profit arose from this setback, however, as new and better machinery was installed in the building, which was promptly repaired. A tragedy still referred to by residents took place in 1868, when a gas meter under repair exploded, killing five men and injuring two, the names of the victims indicating the changing personnel of the mill workers. The Irish had for some time been prominent and had secured a foothold in the community which has been permanent. For the first time a French name appears, a pioneer of the French from Canada who from that time came in increasing numbers until they constituted a majority of the workers, an advantage which they hold to this day. Many English and Scotch operatives followed the installation of worsted machinery and the print works, and permanent settlements have since been made by Poles, Greeks and Italians.

The fabric referred to above as "muslin delaine" was from the first printed in patterns popular with our grandparents, and the Company later installed a calico printing department building an extensive print works. The demand for calicoes and delaines declined suddenly in 1886, and the print works were closed and refitted for worsted work,

cap spinning frames being introduced.

For some time the Company had produced its own cotton goods and operated a mill at Amesbury, in addition to the cotton machinery at Southbridge, but by the year 1917 all the cotton machinery at these mills was sold, and a thorough reconstruction of the organiza-

tion took place.

The fabric known as muslin delaine, first made in 1844, was of such inherent quality that it survived all vicissitudes and has been manufactured continually since that date, later in improved colors as "Danish cloth" and "Danish poplar cloth," both trade-mark names, and is

still in active demand.

Long and faithful service to the Company has been common among its employees, and many have passed fifty years of uninterrupted employment and not a few sixty years. A fourth generation of the same family and name has been enrolled on the books. One of these half-century workers, now a pensioner, whose father had been killed in an accident, was first brought into the mill a baby by her mother and left in a basket in the corner while her mother was at work. Another employee operated the same set of looms forty-five years without interruption from the time they were installed until they were sold for junk.

In the early days the representative of the selling house was the active power in manufacturing, and the plant was financed entirely from Boston. In fact, little or no stock of the Company was held in Southbridge until a considerable amount was sold about two years

ago in a campaign to increase the capital.

The selling agents, Tiffany, Sayles & Hitchcock, later became known as Sayles & Hitchcock, then Sayles & Merriam. Then the selling agents were transferred to Gardner Brewer, later for a short time to John L. Bremer Brother & Co., then for a long period to Joy, Langdon & Co., and recently to the well-known firm of Wellington, Sears & Co.

LUDLOW MANUFACTURING ASSOCIATES

The new plant of the Ludlow Manufacturing Associates at Chengail, near Calcutta, India, recalls the romance of the East and reminds the people of New England of the early days when our merchants sent their ships to China, India and other places in the East. The Hooghly River, too, on which the mill is situated, is mentioned in many of the

logs of our old clipper ships.

Malcolm B. Stone, Treasurer of the Associates, who was largely responsible for the building of Ludlow's Indian plant, describes the view of these buildings erected by New England capital and by American engineers, obtained by the traveller approaching Calcutta. "Through sixty miles of muddy water racing to the Bay with all the force of an eight knot tide, the steamer ploughs ahead, while passengers, scanning the low-lying banks, soon tire of the endless panorama of tropical marsh land, where only an occasional native hut or a white target of the Bengal Pilot Service breaks the monotony. Rounding the bend below Atchipur, interest is awakened at a glimpse of one or two small jute or cotton mills, outposts of Calcutta's enormous textile development, and then just beyond the village of Ulubaria, there appears the first of the large jute mills that line the river from Budge-Budge to Naihati. A view of this plant, probably the most imposing on the river, modern in every respect and obviously following American practice in many outstanding details, invites many questions, to which a ship's officer will reply: 'That's Ludlow, an American mill. There was nothing but a rice field there three years ago."

Ludlow is today a well-known name in Calcutta. In 1910 the Company, which was then one of the largest consumers of raw jute in the world, had no Indian Agency, purchasing all its fibre through either London or New York merchants and brokers. It was thought advisable to have some agents of the Company make the selection of jute in Calcutta, and with this object in view an office was opened in Clive Buildings the following year. The Associates some years later, in 1917, conceived the idea of investigating the possibilities of a plant in the East and despatched a mission to study this problem. The report was favorable, and one hundred and sixty acres in the village of Chengail, fourteen miles from Calcutta, were soon purchased. This land was well chosen, for the railroad facilities of the Bengal & Nagpur Railway handle the land product of the mills, while the river

takes care of the water shipments.

In 1921 it was decided to form a separate corporation, the Ludlow Jute Company, Ltd., incorporated in Massachusetts, to handle the Indian interests, and the following year the factory was placed in operation.

An officer of the Company writes that the plant is the most imposing

From a photograph

VIEW OF LUDLOW, MASSACHUSETTS, SHOWING THE MILLS AND THE TOWN



From a photograph

Kindness of Malcolm B. Stone

OLD STONE MILL OF THE LUDLOW MILLS AS IT APPEARED IN 1888

The fence shown was formerly part of the fence that surrounded Boston Common.

of any on the river, that its machinery is of the latest construction, and that the buildings for the workers are excellent; he adds that the steel stack of the power house, extending two hundred and twenty-two feet in the air, is the highest in Bengal and possibly in the whole of India. The four thousand or so operatives are either Hindu or Mohammedan, and the supervising staff is partly American and partly British, nearly all being housed in residences built by the Company. The baling process handles a tremendous amount of bales per annum.

It may be interesting to describe jute as expressed by an officer of the Associates: "It is a bast-fibre, found between the pith and the outer bark of the jute plant, which grows to a height of from twelve to fifteen feet in a few months. It is extracted by a 'retting' process, which consists of placing bundles of stalks under water until the outer bark has rotted, enabling the grower then to strip the fibre from the pithy core, after which it is hung up and dried. This jute reaches Calcutta in various forms without selection into qualities. Either because of poor selection of seed, lack of fertilization, or improper care in the retting process, the quality of jute received from various parts of Bengal varies tremendously, from fine, silky fibre to almost worthless rejections. The balers in Calcutta who select the various qualities for the export trade have never established a satisfactory basis for their selection. Each man packs his jute according to his

own ideas, and certainly without regard to the desires of the trade. The quality of his production varies tremendously from year to year. There is, of course, recourse to arbitration, and subsequently claims may be collected from the baler, but this never recompenses the manufacturer who buys his jute for a specific purpose. The entire handling of the baling trade is haphazard, and the Ludlow Jute Company, Ltd., stands alone in the production of standard grades of jute that remain unquestionably the same from one season to another. The Associates, by securing this stock, are the only manufacturers in America who buy raw jute direct in India, thereby eliminating many of the commissions and charges usually paid by other manufacturers."

Jute has been known in Europe since 1795, and has been used in spinning since the year 1830. It was introduced into this country soon after its value as a textile product was established abroad, and has since grown into prominence as one of the basic textile fibres.

The history of the Massachusetts plant in Ludlow is also of great interest. In 1788 reference is made to "Dea. Timothy Keyes" mill dam" at Wallamanump Falls, which privilege on the Chicopee River now furnishes the power for the Ludlow Mills. Twelve years later Abner Putnam came from the East and erected a shop for the manufacture of scythes. Twelve years later still the property was transferred to Benjamin Jenks, who came from Smithfield, Rhode Island, Wallamanump then being changed to Jenksville. Two years later a company was formed, consisting of Benjamin Jenks, Washington Jenks, Joseph Bucklin and George Wilkinson, of Ludlow, Massachusetts, and Stephen H. Smith, of Providence, Rhode Island. The latter soon sold out his shares to Samuel Slater, so well known as one of the leading textile manufacturers of New England. The articles of agreement drawn up by these manufacturers stated that the Association was formed "to give the people of Ludlow and the surrounding country a place where warps and yarns could be prepared." This company also purchased twelve hundred acres of land along the Chicopee River which were of great value and at the same time started operations in 1815 in a wooden building located on the present site of the No. 1 Mill group of the Associates.

The establishing of this mill in Ludlow made a change in the mode of life of the town, for the difficult work of preparing and spinning which had previously been done in the household was now transferred to the plant, the wives of the farmers bringing their wool and flax to the mills to be prepared and spun into yarn. The spinning wheel

was soon to be a thing of the past.

A few years later, in 1821, the proprietors organized as the Springfield Manufacturing Company and started construction of a stone building which stood near the old covered bridge connecting Ludlow and Springfield. Two years later the Company installed looms and started the manufacture of sheeting. The operatives in the early days were of native birth, and one of the early mill reports "commended the employees for their excellent health, their sobriety, industry and piety. 'These things being held in firm tenure,' the report stated,



From a photograph

Kindness of Malcolm B. Stone

VIEW OF THE INDIAN PLANT OF THE LUDLOW ASSOCIATES

On the river Hooghly at Chengail, near Calcutta.

'made for an excellent future of the town and the surrounding terri-

tory."

An interesting incident in connection with the Company was the erection of gun works in 1840, the Company forging gun barrels under contract with our Government. This part of the business continued for about six years, at the end of which time the building was used in the manufacture of cotton, but this side line was responsible for some of the inventions which have proved almost indispensable in making

wrought iron.

Just before the end of the first part of the century friction developed among the proprietors, and the Company was sold out to Wood & Merritt of New York, which firm remained in control until 1856. The power was leased to this firm, and at the expiration of the lease the lessee purchased the property at auction and formed the Ludlow Mills Company. Under this management the Company manufactured seamless bags, in which business it was a pioneer. It was also at this time that jute first became one of the basic manufacturing fibres at Ludlow. In 1868 the business was reorganized under the name of the Ludlow Manufacturing Company.

It is especially interesting to mention that in 1848 the Boston Flax Mills were started in East Braintree, Massachusetts, and its business prospered for a number of years. In 1878 it was necessary to rebuild these mills or to move, and the Ludlow Manufacturing Company made an arrangement to take over the good-will and machinery, which was transferred to Ludlow, where the extra volume of business was handled by building additional machinery and buildings and by increasing the water power; more houses for the operatives were also built.



From a photograph

Kindness of Malcolm B. Stone

ANOTHER VIEW OF THE LUDLOW MILLS AT CHENGAIL, NEAR CALCUTTA, INDIA

Many French families came to Ludlow to work in the mills in the year 1870, and about this time a number came over from Dundee, Scotland, including a few from Belfast. In 1892 the first Polish residents came to Ludlow, and they have grown in numbers until they have a large representation in the industry there. The Company has always taken a great interest in the welfare and housing of its

employees.

The Treasurer's report for 1895 stated that "there were twelve acres of floor space, all new since 1878 and 75% built within 8 years, during which time the output increased from 8 to 42 million pounds whereas 12 bagging mills in the United States went out of existence. The village and manufacturing plant are looked upon by all the neighboring country as a model place. All salesmen are particularly anxious to sell their goods to Ludlow as that carries great weight with the neighboring mills."

In 1889 the Hubbard Memorial Library was built and dedicated by the family of Charles T. Hubbard, in his memory. Mr. Hubbard and his son, Charles W. Hubbard, with Cranmore N. Wallace, were largely responsible for the early success of the Company. Another dedication of importance was that of No. 8 Mill which took place in 1901 with a ball and supper given by the operatives and residents of

the town and guests from Boston and Springfield.

The building of the Stevens Club and Gymnasium was also an historic event in the annals of Ludlow. It was dedicated to John E. Stevens, who had been agent of the Company in Ludlow for many

years.

A state report in 1910 refers in these words to Ludlow and the business of the Associates: "The village was well laid out by landscape gardeners and the 500 'model' houses... present an unique appearance



From a photograph

Kindness of Malcolm B. Stone

STREET IN CHENGAIL, NEAR CALCUTTA, INDIA Showing houses of the employees of Ludlow Jute Company, Ltd.

to the visitor. They have an air of distinctiveness that is not found in the average factory village. The streets are clean and well kept... practically every family has its own house and grounds, the houses well planned and equipped with modern improvements, the grounds well cared for and at a rental entirely within their means."

At the present time the plant at Ludlow comprises 1,500 acres,

At the present time the plant at Ludlow comprises 1,500 acres, there being over forty-six acres of mill and warehouse floors and ten miles of railroad track. In addition, the Company owns over six hundred and fifty individual tenements, of which over two hundred and fifty are single houses, rented to its employees.

To appreciate this wonderful plant, a visit to Ludlow should be taken.

NAUMKEAG STEAM COTTON CO.

The disastrous embargoes on shipping immediately preceding and during the War of 1812 sounded the death knell of Salem's supremacy on the sea, for although there was a certain revival of activity in shipping in the 20's, the truth remains that a sad decline had entered into the old town's marine life and there was a steady transference of her overseas trade to Boston and New York.

This fact and the general knowledge of the financial success of the new industry of cotton manufacturing on the Merrimack and the

SOME INDUSTRIES OF NEW ENGLAND



From an old print

Kindness of I. Foster Smith

STAGE POINT, SALEM, 1785, AT THE MOUTH OF THE SOUTH RIVER, THE PRESENT SITE OF THE NAUMKEAG MILLS

It was on this point directly opposite historic Derby Wharf that many ships were built, and this was an ideal place to careen them.

Charles may have been the reason that the people of Salem turned their thoughts towards the project of a cotton factory in the old seaport. At any rate, there were numerous groups of merchants, ship owners and sea captains, either retired on a competency (in those days forty or fifty thousand dollars was a comfortable fortune) or unwilling to follow the shipping to the big cities, who were on the lookout for a safe investment for their capital or savings, and so it happened that the original list of subscribers to stock in the new corporation was very largely made up of the names of men prominent in shipping.

The corporation was chartered in 1839 as the Naumkeag Steam Cotton Company—"Naumkeag" standing for the original Indian name of the locality, the word "Steam" being added to differentiate it from other similar enterprises in Massachusetts, which were invariably driven by water power. In due time, to a great degree through the efforts of Nathaniel Griffin, a retired sea captain, and the grandfather of Nathaniel G. Simonds, the present Treasurer of the mill, sufficient

funds were raised to warrant starting the enterprise.

In the selection of a site for the mill, what more appropriate place could there be to fix upon for its location than Stage Point, at the



From a photograph

Kindness of J. Foster Smith

VIEW OF THE ORIGINAL MILL OF THE NAUMKEAG STEAM COTTON CO.

The plant, opposite the junction of Harbor and Peabody Streets, Salem, Massachusetts, as it looked before it was destroyed by the great Salem fire on June 25, 1914. The new mill is built on this site.

mouth of the South River, directly opposite historic Derby Wharf, and familiar to everybody as the ancient place for building and careening ships; this also used to be the location of the warehouses for preparing and packing in hogsheads the salt codfish, erstwhile a staple freight to the South and the slave islands of the West Indies. There was also bold water along the Point for the docking of vessels bringing supplies of coal and cotton; and, moreover, the ebb and flow of the tide was expected to furnish the necessary humidity of atmosphere so essential for the spinning and weaving of cotton, a condition heretofore thought to be found only along a water course with falls and rapids.

The construction of the first mill was begun in 1845, and by January, 1847, part of the machinery was started, the whole being soon completed and in successful operation. Colonel Charles T. James, the engineer, in his report to the Directors, dated January 19, 1848, said: "The Mill is now in full and successful operation, in all its departments, notwithstanding much of the machinery is of a novel character and of a heavy description, yet the operation of the entire mass is such as to give entire satisfaction, and its performance is quite equal to the anticipation of all concerned. As regards the quality of the goods

manufactured at the Naumkeag Mills, it is only necessary to say, specimens of them took the premium at the late annual exhibition of the Mechanics Charitable Association, at Boston, and at that of the American Institute, at New York, as being superior in quality to any other article of the kind offered at either place." The engineer further states that "the Naumkeag Mill is of much larger dimensions, and contains much more machinery than any other Cotton Manufactory in the Union."

There were some thirty thousand spindles and six hundred and forty looms in the original installation and the total cost including the real estate and the brick boarding houses was \$564,715.77, or not quite

\$19 per spindle.

With the passing years other mills and storehouses were built, until at the time of the great fire there were more than twenty buildings of one sort or another in the mill yard, but at the end of the eventful 25th of June, 1914, nothing remained of the old Naumkeag but the empty walls of the brick buildings and one lone storehouse of reinforced concrete.

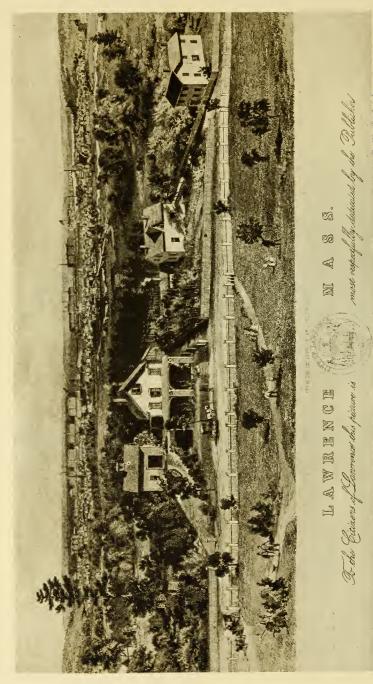
Happily, the day after the fire, the directors decided to rebuild, and on the same location, a year and a half later, a new Naumkeag, of but four buildings,—storehouse, spinning mill, weaving shed and heating plant,—of most approved construction, and perhaps the best cotton mill in the country, had risen phœnix-like from the ashes of the old and was carrying on with every effort aimed to make its product—the Pequot Sheetings—merit all the praise given it in the engineer's report of seventy-five years before.

PACIFIC MILLS

Coincident with the laying out by the Lawrences and others in 1850 of the City of Lawrence, Essex County, Massachusetts, on the banks of the Merrimack River, plans for the Pacific Mills were prepared, the chief promoters of the various local activities being Abbott, William and Samuel Lawrence, John A. and Francis C. Lowell, Nathan Appleton, Patrick T. Jackson and other merchants of Boston and Lowell.

The Pacific Mills incorporated for \$1,000,000 in 1850 and built a mill, said to be the largest in the world, for manufacturing ladies' dress goods, including woolen, worsted and cotton fabrics. The main Cotton Mill was 500 by 72 feet and six to eight stories high. The Print Works was 1,000 feet long and three stories high. At that time the mills contained 1,000 looms with the carding, spinning and dressing machinery to supply them, and ten printing machines.

The product of the mills first appeared on the market in the fall of 1854 and was about 200,000 yards weekly of calicoes and delaines. At that time, under a low tariff, English-printed calicoes and printed delaines were largely in competition with home products, and the contest for supremacy was sharp and in the end was a victory for New



From an old print

Kindness of Pacific Mills

Showing North Andover, Massachusetts, on the right, the Pemberton, Bay State and Pacific Mills in the centre, with the Spicket River on the VIEW OF LAWRENCE, MASSACHUSETTS, FROM THE RESIDENCE OF WILLIAM C. CHAPIN, ABOUT 1856

England factories. In 1857 came the panic which crippled for the time the largest and strongest mills and merchants of the time, but by great efforts in borrowing and extension of credit to the limit, and through its management of exceptional ability, the Pacific Mills weathered the storm. The temporary disruption of the textile industry in this country by the Civil War in 1864 brought anxious days, but the Pacific Mills had fortunately a comparatively large supply of cotton, enabling them to keep the mills running on a curtailed production, thereby helping to relieve the suffering of the employees. Other mills in the surrounding towns were shut down for some time. At the close of the Civil War, 3,500 looms were in operation and 100,000 cotton and 16,000 worsted spindles and eighteen printing machines.

The original capital was gradually increased until in 1862 it was \$2,500,000 and remained at that figure until 1900, when it was increased to \$3,000,000, \$9,000,000 in 1912, \$12,000,000 in 1913, \$15,000,000 in 1917, \$20,000,000 in 1920, and at the end of December, 1922, to

\$40,000,000.

The mills were located wholly at Lawrence, Massachusetts, until 1909, when the Cocheco Manufacturing Company of Dover, New Hampshire, was purchased, the Pacific Mills continuing to operate the plant after transferring the printing machines to Lawrence. erection of the Print Works in South Lawrence began in this year. In 1910 and 1911 a six-story worsted yarn mill and a weave shed containing 1,250 worsted looms and a large finishing building in the Worsted Department were built, together having over twenty acres of floor space. Other large additions prior to this time had been the Central Power Plant and storehouses. The printing business of the Hamilton Print Works of Lowell was bought in 1910, Atlantic Cotton Mills at Lawrence in 1913, the printing business of the Merrimack Manufacturing Company at Lowell in 1916. The latest purchase consisted of four cotton mills of the Hampton Group of the Parker Cotton Mills in Columbia, South Carolina, in 1916, namely, the Olympia, Granby, Capital City and Richland. Their equipment furnished about two hundred thousand spindles and five thousand looms.

At the present time the Pacific Mills occupies 182 acres of floor space and has an equipment consisting of 663,232 cotton and worsted spindles, 15,951 looms and 50 printing machines; the annual pay-roll exceeds \$10,000,000, and the sales have steadily increased until a maximum of \$72,000,000 has been reached. Three hundred and thirty miles of cloth are woven each day, or more than enough to reach from New York to Washington (226 miles) and half-way back again, the annual output of finished cloths reaching more than seven and one-half times around the world. The daily output of cloth finished and packed ready for shipment exceeds 690 miles, or over a mile and a quarter of cloth a minute. For forty years the house of Lawrence & Company has acted as Selling Agents for the Pacific Mills.

It may be of interest to mention that the Pacific Mills is a complete establishment; that is to say, it starts with cotton in the bale and carries it through all the processes of manufacturing, bleaching, printing

TIME TABLE Arranged to make the working hours throughout the year average 11 hours pr day. From March 1st to October 31st, inclusive. COMMENCE WORK at 6.30 A. M. LEAVE OFF WORK at 6.30 P. M., except on Saturday Evenings .-BREAKFAST at 6 A. M. DINNER 12 M. Commence work after dinner 12.45 P. M. From November 1st to February 28th, inclusive. COMMENCE WORK at 7 A. M. LEAVE OFF WORK at 7 P. M., except on Saturday Evenings. BREAKFAST at 6.30 A. M. DIMNER 12.30 P. M. Commence work after dinner 1.15 P. M. BELLS. From March 1st to October 31st, inclusive. MORNING BELLS. DINNER BELLS. First Bell, 4.30 A. M. Second Bell, 5.30 A. M. Third Bell, 6.20 " Ring Out, - - - - 12 M. Ring In. - - - - 12.35 P. M. From November 1st to February 28th, inclusive. First Bell, 5.00 A. M. Second Bell, 6.00 A. M. Third Bell, 6.50 " Ring Out, Ring In, - - - - - - 12.30 P. M. SATURDAY EVENING BELLS. During the month of MARCH, Ring out at 5.30, and APRIL, MAY, JUNE, JULY and AUGUST, 6.30 P. M. The remaining Saturdays in the year, as follows: November. September. January. First Saturday, - 6.06 P. M. First Saturday, - 4.23 P. M. First Saturday, - 4.11 P. M. Second - 5.55 " Second - 4.14 " Second - 4.18 " Third - 4.27 " Fourth - 5.30 " Fourth - 4.01 " Fourth - 4.35 " - - 5.30 ·· - - - 5.17 ·· Fifth December. February. October. First Saturday, - - 3.59 P. M. First Saturday, - - 4.45 P. M. First Saturday, - 5.06 P. M. Second - - 3.55 " Second " - 3.55 " Second " - 3.55 " Third " Third " - 3.55 " Third " Third " - 4.43 " Fourth " - 4.01 " Fourth " Fourth " - 4.02 " Figh " - 4.05 " - - - 4.55 " - - - 5.12 YARD GATES will be opened when the Bell for commencing work begins to ring, and closed when "It stops tolling. RINGING IN BLLLS will ring 5 minutes, pause 2, and toll 3 minutes, when all a will define the last Bell begins to ring. 33634

From original

Kindness of Pacific Mills

TIME TABLE OF THE COCHECO MILLS, ONE OF THE PACIFIC MILLS GROUP—IN DOVER, NEW HAMPSHIRE

Arranged to make the working hours throughout the year 1856 average eleven hours per day.

or dyeing and finishing, passing through as many as sixty-seven processes. It takes the raw wool and handles it through all processes of manufacture and dyeing, so that each case of goods as it is shipped from the mills is ready to go onto the retail dry-goods merchants' counter.

PEPPERELL MANUFACTURING COMPANY

It is only right that the Pepperell Mills should be named for Sir William Pepperrell, one of the important figures in our Colonial history, for this merchant at one time owned a large piece of land in Biddeford, now the home of this well-known manufacturing company. Sir William in fact owned so much real estate in Maine, that he claimed he could travel from Kittery to Saco, a distance of about thirty miles, without leaving his own property. This company, which sends millions of yards of finished products to every corner of the world, has, therefore, one of the most interesting stories attached to it of any of our

New England mills.

William Pepperrell on one of his early trips to Boston in connection with his well-known firm of Pepperrell & Son happened to meet Mary Hirst, the grand-daughter of Judge Sewall. The story of his wooing and marriage is better described in these words in the Company's unusually attractive pamphlet entitled "The Romance of Pepperell." "Not only was she a member of a distinguished Boston family, but she possessed those practical, domestic virtues which would admirably fit her to preside over his household. He took no chances of winning his suit solely on the merits of his engaging personality and polished manners, of which he could not have been wholly unconscious, nor upon the fact that he was heir to a vast fortune; but he presented the young lady with gold rings, a large hoop for her skirt and numerous other gifts of considerable value, designed to impress upon her the extent and sincerity of his affection."

The father of Sir William came to this country from Wales, arriving at the Isle of Shoals without a shilling in his pocket. At first he engaged in the occupation of fishing and later undertook the building of boats. This pursuit took him often to Kittery Point, where he met John Bray, the well-known shipbuilder of that town, which finally led to his marrying his daughter Margery. The father gave them a large tract of land at Kittery Point on which was erected the famous old Pepperrell mansion where Sir William, for whom the Pepperell

Mills were named, was born in June of 1696.

The business of the Pepperrells increased until they owned the largest mercantile firm in the New World, their warehouses were filled with fish from the Banks of Newfoundland, with sugar and molasses from the West Indies and with hemp, iron, linen and silk from Great Britain. To enable them to carry on this immense business it was necessary to have one hundred vessels which flew the house flag known to most of the harbors of the world. When Sir William's brother, Andrew, died, the firm name was changed to William Pepperrell.



From an old print

Kindness of Pepperell Manufacturing Company

VIEW OF SACO AND BIDDEFORD, MAINE,

showing the Saco River and in the centre the mills of the Pepperell Manufacturing Company.

In 1762, soon after Sir William's death, the townships of Saco and Biddeford separated, the part lying on the east side of the river being called Pepperrellboro, in honor of the baronet, this name being changed back to Saco in 1805.

In the early days when the first of the Pepperrells came to this country cotton was almost unknown, most of the fabrics used being either made of wool, flax or silk, in spite of the fact that in the far East cotton had been used for hundreds of years back.

The Company's pamphlet has an interesting chapter on the early history of cotton, parts of which we will quote: "The first mention of cotton in America occurs in the journal of Christopher Columbus, who, under date of October 12, 1492, describes the natives of Watling Island (situated in the Bahamas), where he first landed, bringing among other things skeins of cotton thread out to his ship.

"'Afterwards when we were in the ship's boats,' he continues under the same date, 'they came swimming toward us, and brought us parrots and balls of cotton thread and spears, and many other things which they exchanged with us for other things which we gave them,

such as strings of beads and little bells.'

"Under date of October 13, 1492, he says the natives were ready to trade for everything down to bits of broken crockery and glass. I saw one give sixteen skeins of cotton for three of ceotis of Portugal, equal to one blanca of Spain, the skeins being as much as an arroba of cotton thread. I shall keep it and shall allow no one to take it, preserving it all for your Royal Highnesses, for it may be obtained in abundance. It is grown on this island, though the short time did not admit of my ascertaining this for a certainty."

Columbus also mentions that he found trees of cotton of sufficient fine quality to be woven into good cloth. He also makes other observations showing that cotton was used to a great extent in parts of South

America.

As far as is known, the first mention of cotton-growing in the United States was in the States of Louisiana and Texas. The English colonists

人沙公里

四百零一又一萬七十四百零二號請給示保護等由准此其此布告商民 海狸孔雀三種商標業経江海關臨時註冊處編為一萬七千四百一萬七千 美總領事函美國波斯盾畢柏納爾製造公司用於美國斜紋布之麒蘇 令行地方官廳依法完辨特此布告 雅孔雀三種商標他人不得仿效如有不肖之徒假胃漁利一經發覺 定即 體知悉所有美國波斯盾畢柏納爾製造公司用於正出斜紋布之麒麟海

BUREAU OF FOREIGN AFFAIRS OF KIANGSU PROVINCE

華民國十年七月三

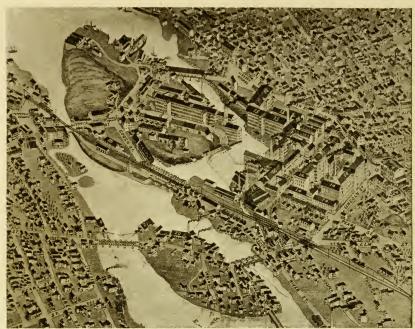
Kindness of Walter H. Bradley

in connection with jeans, which have been already registered with the Maritime Customs, and given by them Nos. 17400, 17401 and 17402.

I, therefore, hereby notify all merchants that the aforesaid three trade-marks must not be imitated. If any infringers be discovered, they will be Notice is hereby given to the public that a letter has been received from the American Consul General asking for the issuance of a proclamation ordering the protection of the trade-marks "Beaver," "Griffon" and "Peacock" of the Pepperell Manufacturing Company of Boston, U.S.A., used handed over to the local authorities to be punished according to law.

30th day, 7th moon, 10th year of the Republic of China

Bureau of Foreign Affairs of Kiangsu Province.



From an old drawing

Kindness of Pepperell Manufacturing Company

BIRD'S-EYE VIEW OF THE PEPPERELL MANUFACTURING COMPANY ON THE SACO RIVER IN 1875

sowed the first cotton-seed in Virginia as early as 1607. It is interesting also to mention that one of the first large cargoes of cotton sent to the colonies was brought to Salem by the ship Desire in the year 1638, the first vessel to bring this article to Boston being a ship called the Trial.

The invention of the cotton gin by Eli Whitney is too well known to bear reproduction, but can be found interestingly described in the

Company's pamphlet.

Where the "old stone fort" once stood on the banks of the Saco in Biddeford, some of the mills of the Pepperell Manufacturing Company are now situated, the plant itself covering more than ten acres in the business centre of the city, which is a thriving mill community with a

population of about twenty thousand.

The history of the mill goes back to 1827, when Rufus Nichols came from Amesbury and built there a shop for the manufacture of cotton-mill machinery, selling it eleven years later to the newly organized Saco Water Power Company. The concern employed Nichols as its agent, and soon opened a shop on the Biddeford side of the river to continue the manufacture of cotton-mill machinery. Very soon after, the Saco Water Power Company built the Laconia Company and made Nichols the agent of this also, the first mill being a small brick building erected in 1848. The workers employed at that time

SOME INDUSTRIES OF NEW ENGLAND

were chiefly American girls, and it is interesting to mention that the Company at one time had a regulation which read as follows: "It is expected that all persons in the employment of the Company will be regular in their attendance upon public worship

on the Sabbath."

The Laconia Mills met with considerable success, which encouraged the Saco Water Power Company to erect the larger Pepperell Manufacturing Company, the latter in turn absorbing the Laconia Company. There was a depression at one time, and the mill was obliged to remain idle for several years, but in a short time, in the year 1850, William Dwight bought the property and became its first treasurer, making a great success with his new enterprise.

For thirty years or so the majority of the employees of these mills were French Canadians, and even today there are a large number of

French employed there, among the 3,600 operatives.
From 1899, the date of the consolidation of the Laconia Manufacturing Company and the Pepperell Manufacturing Company under the latter name, to the year 1915 there were manufactured at these mills 1,030,604,502 yards, or 585,570 miles, of cloth, enough to circumnavigate the earth twenty-three and a half times. A large number of goods have been sent to China and India where they are as well known even as they are in this country. At the present time, a large part of the cotton cloth from the Pepperell Mills is sent to the Lewiston Bleachery & Dye Works, from which finally emerge the pieces of white sheeting so well known to the trade.

Thus, as the pamphlet describes, is the name of Sir William Pepperrell

carried to all parts of the world.

PLYMOUTH CORDAGE COMPANY

In writing the history of the Plymouth Cordage Company it is necessary to go back to the days of the Pilgrims and recall these words from Bradford's History: "On Munday they sounded ye harbor and found it fitt for shipping, and marched into ye Land and found diverse corn fields and little running brooks (as they supposed) fitt for habitation." It will be remembered that the running brooks of old Plymouth town influenced the first-comers in the selection of a permanent settlement in Massachusetts, for they declared that "the water was as pleasant unto them as wine or beer had been in foretime." Down these brooks came the power that was later to bring prosperity to the town, the waters of Town Brook being the first to aid the settlement. The first, second and third brooks, as shown on the ancient plans of the town, still run to the sea though mostly in covered channels unnoticed by the passer-by.

At Nathan's Brook, so called by the old residents, has developed the Plymouth Cordage Company, which in its capacity, quality and character of its products, combined with its financial strength, has made for itself a place in the front rank of New England industry. This brook crosses the main highway two miles from the town centre, this section being called by the first-comers "Playne Dealing," by the older of the townspeople "North Town," by the youth and the irreverent "Bungtown"; the true name, however, is "Seaside," with the post-office address of North Plymouth. Judged by the standards of the present, the locality could not have presented great possibilities one hundred years ago. A fine brook, an unfailing source of water capable of developing a maximum of but 25 H.P., was nevertheless sufficient for that era of the human spider in rope-making, the hand spinner. The power jenny had not then displaced him. The commerce of 1824, foreign and coastwise, was carried in ships and vessels of small tonnage which did not necessitate the use of large hawsers and heavy rigging; therefore, the maximum power could be utilized on one ground of the Ropewalk, additional power not being required until 1837.

To the curious who sometimes ask, "Why did they build these great factories here?" the answer is made, "They were developed here." Plymouth was a town of considerable importance in the year 1824; cod and whale fisheries and foreign commerce gave employment to fishermen and seamen, while an iron mill and nail factory, cotton spinning and weaving made employment for the mechanic. Transportation, of course, was mainly by water, and Plymouth, a town of less than five thousand in population, maintained six coastwise packets and two schooners which made regular trips around the Cape to Nantucket, Martha's Vineyard and New York. New Bedford, a shipping centre, was only a day's journey by ox-cart. Shipbuilding had also developed along the Jones and North Rivers and along the coast of the new State of Maine and was increasing rapidly. In short, there was a demand for honest rope.

The War of 1812 had had its effect on the foreign commerce of New England, and capital was turning to manufacturing for investment. It was the beginning of a new era, and the additional protective tariff of 1824 gave impetus to this new development. Bourne Spooner, Plymouth born, rope-maker and merchant, saw here his opportunity, which he made use of with skill and energy. There was never a stay or shroud laid in the Ropewalk that Spooner did not see begun. As an officer of the Company well expresses it, "Mind and conscience in the manufacture of its product, despite changed conditions of transportation, character of products and increased competition, have made the Plymouth Cordage Company the largest producer of hard-fibre cordage

in the world!"

Rope-making had long been a Massachusetts industry, for it had its beginning in Boston in 1641. There were many ropewalks in Boston previous to the Revolution, but, as there had been several serious fires, the citizens believed that they should be removed from the city

proper, which was accomplished by Mayor Quincy in 1824.

The business of the Plymouth Company grew both in tonnage and reputation, in consequence of which new factories were built and the necessary power increased. Bourne Spooner ended his work in 1870, being succeeded by his son, Charles W. Spooner. The health of the new Treasurer, unfortunately, did not permit of active work, and in

From an old print

RARE VIEW OF THE PLYMOUTH CORDAGE COMPANY, PLYMOUTH, MASSACHUSETTS, ABOUT 1870 SILKAL ALIC CONDACE CO LATAND ALICH AND SAVER CONTRACT

Kindness of Augustus P. Loring

1882 one of the finest citizens Plymouth has ever produced, Gideon Francis Holmes, became the Treasurer. His life was spent with the Plymouth Cordage Company from 1859 until his death, but his vision reached far beyond the town. Mr. Holmes was proud of the reputation of Plymouth Rope, and, to use a slang expression, he never took a chance with its reputation. On one occasion, through the carelessness of a workman, a single yarn of an inferior fibre was run into a rope of superior quality. The rope was of great length, and to make it over involved expense and delay in shipment. The foreman, undecided, sought instructions from his superior, arguing that if remade it could not be shipped as promised. The workman added that this short length of yarn of inferior fibre would not injure the rope, and could not Mr. Holmes write a letter to the purchaser in explanation? The head of the Cordage Company answered: "Yes, I could write this letter and without doubt the purchaser would be satisfied because of the reputation of the Plymouth Cordage Company, and I am careful of that reputation. I could explain this defect in manufacture to a purchaser, but never to a competitor if he by chance should see it. The right way is to make it over. Go to work on it

There had been great changes in the cordage industry, for rope was no longer made for the mariner alone. The development of our Nation had opened up new fields, the hardware trade, the farms of the West. In 1882 the Company sold its first lot of 385,000 pounds of Binder Twine, whereas now the same amount can be manufactured in a few days. Now began the rapid development of the Plymouth Cordage Company. The building of No. 2 Mill to take care of the twine business of the Company was followed by the building of the Welland, Ontario, plant, and later, in 1909, by the completion of

Mill No. 3.

Mr. Holmes completed his work in 1911, to be succeeded by his able son, Francis C. Holmes, the present Treasurer. Under the present management the Plymouth Cordage Company awaits with satisfaction the completion of one hundred years of incorporated existence. The

the completion of one hundred years of incorporated existence. The corporation has been fortunate in the personnel of its officers, and the changes have been infrequent. The directors of the Company have been vitally interested in its affairs, and have given their time, their personality and at times their credit to aid the Company. Four generations of the Loring family have given to the Company their service, which has helped to make the Plymouth Cordage Company

a typical New England industry.

THE TELEPHONE

Among the many other things for which Boston is famous is the fact that the city has the distinction of being the birthplace of the telephone. On the afternoon of June 2, 1875, the late Professor Alexander Graham Bell and his earliest associate, Thomas A. Watson, now living in Boston, were working in two garret rooms over the elec-

SOME INDUSTRIES OF NEW ENGLAND



From an old drawing

Kindness of New England Tel. & Tel. Co.

LYCEUM HALL, SALEM, MASSACHUSETTS, WHERE ON MARCH 15, 1877, PROFESSOR A. GRAHAM BELL ADDRESSED A PARTY OF SCIENTIFIC MEN IN BOSTON

Every word was heard all over the hall, and the spectators were so astonished, that they broke into applause, and, what was marvelous, the applause was heard in the Boston office eighteen miles distant.

trical workshop of Charles Williams at 109 Court Street, Boston, to perfect the harmonic telegraph, and thereby to work out Bell's theory of transmitting speech. While they were testing some modifications of the instruments, one of the transmitter springs stopped vibrating, and Watson, who was retuning the receiver springs, "plucked" it to start it again. It did not start, and while Watson continued to "pluck" it he suddenly heard a sound from Bell in the next room, who rushed out, demanding: "What did you do then?

Don't change anything. Let me see!"

The explanation as given by Mr. Watson is very simple to an expert. The make and break points of the transmitter spring which he was trying to start had become welded together so that when he snapped the spring the circuit had remained unbroken, while that strip of magnetized steel, by its vibration over the pole of its magnet, was generating that marvelous conception of Bell's—a current of electricity that varied in intensity precisely as the air was varying in density within hearing distance of that spring. The speaking telephone was at that moment born. Professor Bell knew perfectly well that the mechanism that could transmit all the complex vibrations of one sound could do the same for any sound, even that of speech. Before they parted that night, Bell gave Watson directions for making the

first electrical speaking telephone. All the experimenting that followed that discovery, up to the time the telephone was put into practi-

cal use, was largely a matter of working out the details.

During the intervening forty-eight years since that historic occasion the electrical workshop of Charles Williams has passed out of existence, but the garret rooms in which the early telephone experiments were made remain just as they were in 1875, and as they were shown in an illustration in one of the Trust Company's former brochures.

Bell and Watson had been working together for many months before the first crude solution of their problem was worked out. Both were young men imbued with great enthusiasm. Most of Bell's early experimenting on the harmonic telegraph was done in Salem at the home of Mrs. George Sanders, where he resided for several years, having charge of the instruction of her deaf nephew. Watson occasionally worked with Bell in the Salem house, but most of the experimenting which they did together was in the Williams workshop, which was one of the largest and best-fitted shops in the country at that time.

Forty years later a memorial tablet marking the birthplace of the telephone was placed on the exterior of the building at 109 Court Street, Boston, by the Bostonian Society and the New England Telephone and Telegraph Company. At that time Professor Bell and his

wife were present at the dedication exercises.

More than nine months after the first sound was transmitted by telephone, Professor Bell received from the United States on March 7, 1876, a patent No. 174,465, and thus established the existence of the Bell telephone. It has well been called the most valuable single patent ever issued, for it has annihilated space, marvelously extended the facilities of conversation, revolutionized business and made neighbors of 115,000,000 people. Neither Bell nor Watson had any idea that the crude little instrument, which made it possible to carry a complete sound along a wire for the first time in June, 1875, was the beginning of a system that would within fifty years connect nearly 15,000,000 telephones with a network of copper wire, join together over 70,000 cities and towns in the United States and make possible nearly 40,000,000 telephone conversations every day.

Soon after the first telephones were made, Bell hired two rooms on the top floor of an inexpensive boarding-house at 5 Exeter Place, Boston, since demolished to make room for mercantile buildings. He slept in one room; the other he fitted up as a laboratory. After that time practically all the experimenting was done there. It was not until March 10, 1876, three days after the patent had been granted, that Professor Bell and Watson were working one evening, when the latter heard Bell say, "Mr. Watson, please come here; I want you," the first complete sentence ever transmitted by telephone. It made such an impression upon Watson that he wrote that first sentence in

a book which he has always preserved.

Three months later Professor Bell took one of his telephone instruments to the Centennial Exposition at Philadelphia and placed it on exhibition in an inconspicuous corner. It attracted little attention

until one day the Emperor Dom Pedro of Brazil was passing and stopped to look at the new instrument. By a strange coincidence, some years before, he had once visited Bell's class of deaf mutes at Boston University, where the latter was an instructor, and it was through the friendship of the Emperor that the attention of the greatest scientists of the world were attracted to the telephone, at a time when the world was calling the invention a "mere toy" and the "latest

American humbug."

On October 9, 1876, the first conversation ever held over a telegraph line (for there were then no telephone lines in the world) took place between the Boston and Cambridge offices of the Walworth Manufacturing Company, by permission of the Company. Professor Bell was at the Boston end of the line and Mr. Watson was at the Cambridge end, the distance apart being about two miles. At the Cambridge end Watson waited until Bell signalled from the Boston office. For some moments no words could be heard, but Watson made a few adjustments and before long he heard Professor Bell in Boston cry out the nautical expression "Ahoy! Ahoy!" That was the word used up to that time in opening a telephone conversation, and this same expression was used during all the previous experiments, the

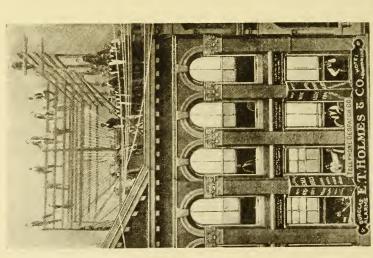
word "hello" not coming into use until some months later.

In order to convince the sceptics that it was really possible to talk over a distance of two miles by means of telephone instruments at either end, it had been previously arranged that Bell and Watson should make a long-hand record of all that was sent and heard that night. On the morning of October 19 the Boston Daily Advertiser printed the entire conversation at either end of the line in parallel columns. In an editorial on that day the Advertiser said: "The sound of the spoken words was clearly and distinctly carried by the wire and heard at the other end with marvelous accuracy. It was as if the two gentlemen conversed through a speaking-tube. It is not easy to see why, if the spoken word could thus be articularly transmitted so as to be audibly intelligible through two miles of wire, it may not be transmitted through a hundred miles or more. It is already evident that its significance in the demonstration of the laws of sound is important as well

From that time on, both Bell and Watson devoted practically all of their time to experimenting and devising new methods and improvements. About this time they began to go about Boston and in the suburban cities and towns giving telephone demonstrations to the public. On November 26, 1876, the first long-distance telephone conversation ever held took place between Professor Bell at the Eastern Railroad Depot in Boston and Mr. Watson in Salem, a distance of about seventeen miles. Of course, the conversation was over a telegraph wire, and, although it was not suited for the purpose, both men

were able to hear each other.

About a week later Professor Bell was so confident that the telephone would work over a much longer distance, that he sent Mr. Watson to North Conway, New Hampshire, 139 miles from Boston,



From a photograph Kindness of N. E. Tel. & Tel. Co. HOME OF THE FIRST TELEPHONE COMPANY



From a drawing

Kindness of Perry Walton

THE FIRST BOSTON TELEPHONE EXCHANGE

The Telephone Despatch Company was located at 342 Washington Street, Boston, where Wright & Ditson are now. Here the Company remained until the spring of 1880. In this building, Miss Emma Nutt, the first woman telephone operator, was employed.

and on December 3, 1876, Professor Bell at the Eastern Railroad Station in Boston talked for some time to his associate in New Hampshire. Mr. Watson had taken a supply of apparatus with him, and they made all sorts of changes to ascertain the best conditions on a long-distance line.

The fame of the telephone was now beginning to spread, and the number of audiences that were willing to compensate Professor Bell to hear him talk about his invention and see it demonstrated was steadily increasing. The first of these lectures was given on February 12, 1877, before the Essex Institute in Salem. On this occasion he had the use of one of the Railroad Company's lines, and Mr. Watson at Boston telephoned to the audience at Salem, the tones of the voice being heard by the whole audience, while many of those within a few feet could actually understand what was said. Henry M. Batchelder, now president of the Merchants National Bank in Salem, was the Salem correspondent of the Boston Globe at that time, and he asked Professor Bell if he could send a report of the meeting to the newspaper by telephone. The experiment proved a success, and the story in the Boston Globe the next day was copied all over the world as the first newspaper despatch by telephone.

After a great deal of experimenting it became possible early in the year 1877 to carry on a conversation between Boston and New York, but, of course, over a telegraph circuit that was noisy and subject to all kinds of interferences. The actual date of this conversation was April 3. The following day the first real telephone line in the world was opened, connecting the workshop of Charles Williams, Jr., on Court Street in Boston, with his house in Somerville. Bell and Watson were present and participated in the important ceremony of opening this line, the event proving to be a headliner in the Boston papers the fol-

lowing morning.

To Edwin T. Holmes, however, fell the honor of opening the first telephone central office in the world, which was established at 342 Washington Street, Boston, in May of the same year. There were two small switchboards, and it was in this building that Miss Emma Nutt, the first woman telephone operator, was employed. Mr. Holmes's original idea was to connect this central office with a number of express offices in Boston and thereby facilitate business by transmitting orders through these little switchboards. The business, however, developed slowly, and the future at times was full of discouragement, for a month later there were only 230 telephones in all the world—most of them in what is now Greater Boston.

A few months later Holmes extended his telephone business so that his central office was able to make telephone connections between a small number of business houses in Boston. In 1878 the first telephone directory in the world, as shown in an illustration, was published by the Telephone Despatch Company. It contained the name of sixty-seven firms representing thirty-four lines of business. There were no telephone numbers in those days, all calls being made for

General Business Officer No. 342 Washington Street. E. T. Holmes, Manager. The above Company proposes, and is now prepared, to establish direct Texacritiving Converse travely between each and every brichese bouse in this City. Whatever impury you wish to indee, because you was but to indee, because you was but to indee, because the wind to trained a rossely now was to communicate with This is about by communicating through the Telephone, to a Control Office, that you desire to speak to M. A., B. or C. In an instant your communication is made direct and complete, and you can correct out your conversation,—which if it is negarify for a third party to overhear—eagues against the Control Office when you are through. Every Bank, Office, Business House and Profession in this City are expected to connect with this Central Office System. THE FOLLOWING FIRMS HAVE ALREADY SUBSCRIBED. Agricultural. Furniture. OOTH & HAYDEN. PELK, NORTH & FINE, DIFF, TAYLOR & CO. DAVID WHATE & CO. Carriages. WH. P. SARGENT & CO., Terment St., WH. P. SARGENT & CO., Section St. fron and Steel, STAR SALT CASTER CO., Precition St. STAR SALT CASTER CO., Servets St. Lawyers. Small Wares, Confectioners CHAR COPELAND A. CO. P. S. WEUER. Spool Cetten. China, Glass & Earthonnaire, abeam firescen & Cr. Joses, Models de la stratton. Clarke, alemas & Clarke. Norchess Bellen & Cr. Lecture Burran. L E LAWRENCE & OO. DWINKLIA BATWARD A CO. DATIA SACKER & PEREINA Druge, KTHE HARRING A. HAVLEY, FEAR BROWN, D. C. GORNING N. C. C. TITUS, INVASITELLE A. MITTE, TO A. C. C. W. LOWE, TO A. C. C. W. LOW, TO A. C. C. W. LOW, THE STREET, THE S Sienm finner-de. Arrentific Agencies. Steamship Lines. Millinery Goods. SECTION, HE A CO.

Reproduction of first telephone directory

TELEPHONE DESPATCH CO. (Bell's Patent.) General Business Office:

No. 342 Washington Street.

E. T. Holmes, Manager.

The above Company proposes, and is now prepared, to establish direct Telephonic Communication between each and every business house in this City. What-ever inquiry you wish to make, business ever inquiry you wish to make, business you wish to transact, or message you wish to communicate with any other business house or profession in the City, can be done while seated at your desk. This is done by communicating through the Telephone, to a Central Office, that you desire to speak to Mr. A., B. or C. In an instant your communication is made direct and complete, and you can carry on your correstation,—which it is impossible for a third party to overhear,—again signaling the Central Office when you are through.

your conversation,—which it is imposible for a third party to overhear,—again signaling the Central Office when you are through.
Every Bank, Office, Business House and Profession in this City are expected to connect with this Central Office System. The following firms have already subscribed. Agricultural—Ames Plow Co.; Banks—; Bankers—; Boots and Shoes—; Brass Goods—Holmes, Booth & Hayden; Carpets—John H. Pray, Sons & Co., I. & J. Dobson, Bay State Carpet Co.; Carriages—Wm. P. Sargent & Co., Tremont St., Wm. P. Sargent & Co., Toffice, Confectioners—Chas. Copeland & Co., Miner, Beal & Hackett, Leland, Rice & Co.; Confectioners—Chas. Copeland & Co., F. E. Weber; China, Glass and Earthenware—Abram French & Co., Jones, McDuffee & Stratton, Clarke, Adams & Clarke, Norcross, Mellen & Co.; Coffee, Spices, etc.—Dwinell, Hayward & Co., Davis, Sacker & Perkins; Drugs—Carter, Harris & Hawley, Cutler Bros., Goo. C. Goodwin & Co., Sinth, Doolittle & Smith, B. O. & G. C. Wilson, Beverly St., Joseph T. Brown & Co., J. D. Judge; Dry Goods—Upham, Tucker & Co., Farley, Harvey & Co., R. H. White & Co.; Fish—Shattuck & Jones; Furniture—J. S. Paine & Co., T. M. Whidden & Co., B. P. Cunningham & Co.; Glass—Lambert Bros., Hills, Turner & Co., R. Sherburne; Grocers—S. S. Pierce & Co., McDewell & Adams, Cobb, Bates & Yerxa, C. D. Cobb & Bros.; Hardware—; Hats and Caps—Peck, North & Fisk, Dyer, Taylor & Co., David Wilcox & Co.; Fron and Steel—; Lawyers—; Leather—; Lecture Bureau—B. W. Williams; Liquors, Wines, etc.—T. J. Cowdry & Co.; Painet Solicitors—Henry W. Williams; Liquors, Wines, etc.—T. J. Cowdry & Co.; Paints—J. A. and W. Bird & Co.; Paper Warehouses—Rice, Kendall & Co., Rettiners—C. H. Craves & Sons; Salt Casters—Star Salt Caster Co., Franklin St., Star Salt Caster Co., Everning Co.; Steamspip Lines—Cunard Steamship Co.; Steam Gauges, etc.—Ashcroft Manufacturing Co.; Steamspip Lines—Cunard Steamship Co.; Tailors' Trimmings—Mullen, Ide & Co.; Woolens—E. Allen & Co.

Kindness of New England Tel. & Tel. Co.

THE FIRST TELEPHONE DIRECTORY

The Telephone Despatch Company, in October, 1878, called attention to the fact that it was prepared to establish direct telephonic communication between each and every business house in the city of Boston. It is interesting to note the names of some of the firms who were subscribers. A transcript appears beside the illustration.

SOME INDUSTRIES OF NEW ENGLAND

individuals or firms. At that time there was no telephone company in the world, and Bell and Watson were practically the only men who knew anything about the business; Watson, with his own hands, had built the first telephone instruments and had run the first telephone wire. There was no experience to guide them and no tradition to follow.

In August, 1877, when there were 778 telephones in use, the "Bell Telephone Association" was formed, but the company had no capital,

because there was none to be had.

Eight months after Holmes had opened his first office, which was originally intended to serve the express offices in Boston through the day and become a burglar alarm at night, the New England Telephone Company was organized, on February 12, 1878. It was the first of the Bell companies and was followed on July 30 by the incorporation of the Bell Telephone Company.

The chronology of the telephone from those early days, epitomizing the advances that have been made in telephone science and particularly in long-distance telephone communication, can be summarized as

follows:

On October 1, 1883, the New England Telephone and Telegraph Company was organized, with 16,518 telephones; on February 7, 1893, the Boston-Chicago line was opened for business from the Company's office at 125 Milk Street, Boston; on January 25, 1915, the Boston-San Francisco line was opened from the same building in Boston; and on September 27, 1915, took place the first wire and wireless telephone message, which was spoken by President Vail of the American Telephone and Telegraph Company in New York to John J. Carty, Vice-President of the Company, at Mare Island Navy Yard, California.

On September 29, 1915, was carried on the first wireless telephone message from Arlington, Virginia, to Honolulu, Hawaiian Islands, a distance of 4,600 miles. On April 11, 1921, occurred the opening of the Havana-Key West telephone submarine cable by President Harding of the United States and the President of Cuba, at which time Havana was linked by telephone with Santa Catalina Island in the Pacific Ocean, a distance of 5,600 miles, by means of the submarine cable, the land lines of the Bell System and a wireless circuit connecting

the island of Santa Catalina with the mainland.

On January 14, 1923, President H. B. Thayer of the American Telephone and Telegraph Company and other officers of the Company talked for two hours by radio telephone from the office of the Company at 195 Broadway, New York, to England, their voices being distinctly heard by a group of distinguished scientists, engineers and officials.

The first practical telephone line was a copy of the best telegraph line of the day, a line wire strung on poles and housetops, using the ground for a return circuit. Electrical disturbances were picked up by this line and were frequently so loud in the telephone instrument as to destroy conversation. When a second telephone line was strung beside the first, even though perfectly insulated, the conversation carried on over one of these wires could plainly be heard on the other.

By the year 1881 the telephone company had laid experimental underground cables for a short distance alongside a Massachusetts railroad track, with but small results. Two years later, several cables were laid in Boston, the longest of which were 1,500 feet. Type after type of cable was developed and installed, only to be withdrawn within a few years and replaced by something better. Today the longest underground cable in the world extends from Boston to Washington, and the New England Telephone and Telegraph Company has now placed more than two-thirds of its telephone wire of all kinds in cables under ground, this method requiring nearly 2,000,000 miles of wire in

From the earliest days of Professor Bell's experiments to the present time Boston men and Boston capital have developed the business and made the great Bell System what it is today. Dr. Clarence J. Blake, who in the early 70's was a famous Boston physician and aurist, was associated with Professor Bell for at least a year before the telephone was born, in working out a theory of vibration of the eardrum. Among the first men in Boston to give support and approval as well as financial assistance was Gardiner G. Hubbard, a widely-known Boston lawyer, whose daughter Professor Bell subsequently married. Thomas Sanders of Salem has been called the "godfather" of the telephone, for the reason that he advanced most of the money that was used by Bell and Watson in experimental work. From 1874 to 1878 he contributed ninetenths of the money that was spent on the telephone. Another man who played an important part in the development of the telephone was Francis Blake, inventor of a transmitter which was a great improvement on those then in use.

Relatives of Sanders—the Bradleys, Saltonstalls, Fays, Silsbees and Carltons—together with Colonel William H. Forbes, all of Boston, were the first capitalists who for purely business reasons invested money in the Bell patents and put \$50,000 in its treasury. The first President of the National Bell Telephone Company, incorporated on March 13, 1879, with \$850,000 capital, was Colonel William H. Forbes, who took up the financial load that had been carried so long by Mr. Sanders.

During the fourteen months' litigation between Professor Bell and his associates and the Western Union Telegraph Company over the rights to use certain patents, the Bell interests were defended by two well-known Boston lawyers, Chauncy Smith and James J. Storrow, father of the present James J. Storrow of Lee, Higginson & Co. They were greatly aided in their work by Thomas D. Lockwood of Boston,

who was chosen in 1879 to establish a patent department.

The second President of the Bell Company was Howard Stockton, who was succeeded by John E. Hudson of Boston, also a well-known lawyer, and then by Frederick P. Fish. John J. Carty, the master telephone engineer of the world, who is now a Vice-President of the American Telephone and Telegraph Company, was a Cambridge boy and was employed by the telephone company in Boston for some years.

Theodore N. Vail, who resigned his position as head of the railway mail service at Washington to accept the general managership of the

struggling telephone company, and who later was President for a long time, was a resident of Boston for several years and was connected with many other business enterprises. Among other men who played an important part in the early days of the telephone were William R. Driver, father of the present Vice-President of the New England Telephone and Telegraph Company, Jasper N. Keller, for many years General Manager and later President of the New England Company, and General Thomas Sherwin, for years the General Auditor of the American Company and for more than twenty years President of the New England Company. One of the present officers is Robert W. Devonshire, a Vice-President, a resident of Boston, who started in the telephone business more than forty years ago. Another active Vice-President is E. K. Hall of the American Company, well known to Boston, and a former Vice-President of the New England Company. Vice-President Walter S. Gifford of the American Company was born in Salem and was employed by the Company in Boston for a number of years. Eleven of the nineteen directors of the American Telephone and Telegraph Company are Boston men, and the development of the business in future years will depend largely on their business foresight and judgment.

TILESTON & HOLLINGSWORTH COMPANY

When Mark Hollingsworth, at the age of sixteen, left his native State of Delaware to take employment in a small paper mill in Mattapan, Massachusetts, he little dreamed of what this change would mean to New England. As a matter of fact, three of the best-known mills in that locality would not exist today had it not been for this early decision. The Tileston & Hollingsworth Company, of Boston, the Hollingsworth & Vose Company, of East Walpole, and the Hollingsworth & Whitney Company, all owe their existence to this Mark Hollingsworth, who founded the first-mentioned firm, and to his

descendants who organized the last two.

Jeremiah and Smith Boies engaged Mark Hollingsworth in 1793 to take charge of paper-making in a mill below Mattapan on the Neponset River. This locality is historic ground in the paper industry for near it stood the second paper mill in the country and the first in New England, which was started in the year 1728. Furthermore, Boies' grandfather, Jeremiah Smith, had taken charge of that very mill in 1737, so that the early traditions were handed down from father to son and finally absorbed by Mark Hollingsworth. The slogan of the Tileston & Hollingsworth Company, "Papers of Old-Fashioned Quality," is therefore much more than a catchword, for the President of the Company is now the great-grandson of its founder.

In 1801 Mr. Boies retired from active business and rented the mill to Mark Hollingsworth who formed a co-partnership with Edmund Tileston of Milton. The young pair flourished, and, as it would make too long a story to relate the details of their success, suffice it to say that one by one they absorbed all the small mills in their



From a photograph

Kindness of Amor Hollingsworth

VIEW OF THE OLD FULLER MILL IN MATTAPAN SQUARE ABOUT 1860

Where Z. T. Hollingsworth, now a director of the Tileston & Hollingsworth Company, and chairman of the board of Hollingsworth & Vose Company, first learned to count and finish paper.

neighborhood. In 1828 they were operating the Fuller Mill, which many can still recall as an old Milton landmark, close to the Mattapan Bridge over the Neponset, and eight years later they acquired the Sumner Mill at Hyde Park on the present site of the Tileston & Hollingsworth mill, a small portion of the older buildings being still in use as stock houses. Five years previous to this purchase, the partners had admitted their sons, Edmund P. Tileston and Amor Hollingsworth. Edmund Tileston died in 1834. Mark Hollingsworth retired in the following year, but was happily spared for twenty years more to enjoy the increasing success of the junior partners. The year following the purchase of the Sumner Mill, 1837, this property was increased by the purchase of the Taft property adjoining, formerly occupied by a cotton mill which had burned down. A new paper mill was here erected, equipped with four beating engines and a Fourdrinier machine.

There seems to have been nothing in particular to remark in the succeeding twenty years, though they were evidently accompanied by success as attested by the development of later days. In 1880 Frank L. Tileston, the son of Edmund P. Tileston, was admitted to the firm, and at about the same time Amor Hollingsworth, who was graduated from Harvard College in 1859, began his connection with them and in 1865 also became a partner. It was in these years that they undertook the most ambitious addition to the properties which had marked the history of the business up to this time. In 1863

PAPER MILLS,

IN

Compliance with the Recommendation of

The late Provincial Congress, and to Encourage the

Paper Manufactory,

W E now propose to give one shilling old tenor per pound, for all white Linnen, and cotton and Linnen Rags, suitable for making, either a writing or printing PAPER; which is two-pence per pound more than we have ever yet given: It is therefore hoped, that more attention will be paid to this affair in future, both from a principle of patriotism and frugality. The present alarming situation of the Colonies, renders it entirely needless to point out the utility of establishing this, and every kind of manusactory among us; and if each family will but lend their aid, to encourage this business, by saving their Rags, there may be a sufficiency of Paper made here, and entirely prevent the importation of that article, into this country.

Any Gentlemen, Traders or others, throughout the Country, that will so far promote the interest of America, by receiving Rags for the aforesaid purpose, shall be paid ten per cent. commissions, and all the charges of transportation, either by land or water to said Mills: And the smallest favours gratefully acknowledged by their very

Humble Servants.

BOIES and CLARK

N. B. One Copper per pound given (as usual) for Check Rags, and all other course forts, that is either made of Hemp or Flax.

MILTON, January 10th. 1775.

《水型运行的基本的水流运行,从企业产业工程的

1765 BOIES and CLARK 1777 BOIES and McLEAN

1790 J. S. BOIES 1801 TILESTON & HOLLINGSWORTH

1889 TILESTON & HOLLINGSWORTH CO.

"Paper Makers for More Than One Hundred Years"

From an old handbill

Kindness of Amor Hollingsworth

COPY OF AN OLD HANDBILL

that Boies & Clark distributed in 1775 for the establishment of a paper mill at Milton, Massachusetts.

they purchased from Thomas Leveridge the property formerly owned by the Dorchester Cotton and Iron Company, situated just above the Central Avenue bridge, and proceeded to erect a modern paper mill. Amor Hollingsworth had direct charge of this construction, and no expense was spared to make a model factory. Particular attention was paid to securing substantial foundations, which were made of Quincy granite from the quarries not far away. At the same time, the builder of the paper machine, John L. Leaverns, of Worcester, was given a "carte blanche" order to produce the best machinery of which he was capable, and in consequence the Eagle Mill, as this property was called, was unsurpassed in excellence by any of its day.

The principal output of the Company for many years, as at present, was high-grade book paper, though in its earlier days they had made writing papers. There were also a number of specialties which are worth mentioning. At the Fuller Mill, colored papers were made, which were used for cover papers and for ballots at the time when the candidates' names were presented upon papers of characteristic hue, denoting their political affiliations, a practice which the secret ballot system has fortunately ended. At the Gillespie Mill was made a special blue sugar-loaf paper, in the manufacture of which ground

logwood was used for coloring.

The Sumner Mill achieved an enviable reputation for lithograph, etching, chart and plate papers. Only the highest quality of rag stock was used for the latter and infinite care was taken to insure freedom from iron, the machine being run very slowly, producing only about 1,200 pounds per day. The Eagle Mill was largely devoted to making fine book papers, and also for many years made a special blue wrap-

ping paper for the Walter Baker Chocolate Company.

In 1872, Amor Hollingsworth, the senior partner, died. Besides having been a very competent and successful manufacturer, he was a shrewd, conservative investor. Frank L. Tileston, the junior partner, was a man of high integrity, and to him now fell the financial and sales end of the business for twenty-five years. Up to the time of his death in 1885 he was an important factor in the success of the business, and on his demise he left his interest in the business to his brother, John Boies Tileston, a publisher in the firm of Brewer and Tileston. In 1879 important improvements were made: up to this time the mills had depended upon water power and in consequence were frequently shut down in the summer because of low water. Steam power was therefore installed, under the direction of the new superintendent, Robert Mossman, who served many years afterwards with the Company, enjoying the full confidence of Mr. Hollingsworth. In 1881 manufacture was discontinued at the old Fuller Mill, though offices and storage were maintained there for a good many years. The 72-inch machine from that mill was now transferred to the Eagle Mill. One of the first Jordan engines was also installed in this mill in 1887, which, according to Mr. Mossman, was the invention of Joseph Jordan, with whom he had worked at the Ivanhoe Paper Company of Passaic

SOME INDUSTRIES OF NEW ENGLAND

Falls, New Jersey. The time in beating was nearly halved by the introduction of this refiner.

In 1881 the Company added to its property by the purchase of a mill in Groton, for \$50,000. This plant had originally been acquired in 1846 by John Mark and Lyman Hollingsworth, sons of Mark Hollingsworth, but in 1851 Lyman sold his share to his brother, who replaced the original wooden mill with one of brick. After a destructive fire the following year, they again rebuilt, and operated in the manufacture of book paper. In 1865, John Mark Hollingsworth sold back the property to Lyman, who had the misfortune, in 1876, to have his mill burnt again. For a third time the mill was rebuilt, and five years later was sold, as above stated, to Tileston and Hol-

lingsworth.

The entrance of John B. Tileston into the firm unfortunately led to some differences of opinion, for, although not trained in the paper business, he was anxious to take an active part, and Amor L. Hollingsworth, who had been brought up in the business, very naturally felt that his experience entitled him to a controlling voice in its management. Charles W. Wilder, William T. Barker and George W. Wheelwright, all paper makers, were asked to make an appraisal of the properties, preparatory to a division of interests. Happily, however, an agreement to incorporate was substituted, Mr. Hollingsworth securing a controlling interest. Thus, in 1889, the Tileston & Hollingsworth Company was incorporated under the laws of Massachusetts, with a capital of \$500,000, the officers being: Amor L. Hollingsworth, President, and John B. Tileston, Treasurer. The wisdom of the arrangement was soon proved, and another era of expansion followed. In 1897 the facilities at the Sumner Mill were enlarged by the erection of a new building called the Hyde Park Mill. The growth in the publication of magazines was quite marked at this time, and among those who received considerable assistance through credit in their early days were the McClures, and Doubleday, Page & Co. In January of the following year Mr. Tileston died, and was succeeded by George F. Child, who had been connected with the Company for many years as an accountant. Ever since the incorporation of the Company, and until within a short time of his death, Amor L. Hollingsworth was the motive force of the concern, and in his latter years his strong character bore up stoutly against a slowly increasing infirmity terminating in his death in 1905. He was bluntly outspoken and ruggedly honest, and was noted among his employees for his fairness. In fact, the entire absence of labor troubles during the long course of the Company's existence is a creditable reflection on its management to this day.

Mr. Hollingsworth, having had the misfortune to lose all of his children during a fever epidemic and being desirous to see the management of the properties continued in the family, persuaded his nephew, Amor Hollingsworth, to abandon the practice of law and become associated with him, with the ultimate idea of becoming his successor. Thus in 1905, on the death of Mr. Hollingsworth, the responsibilities of management passed to the fourth generation since the founding of the original partnership. Great changes have come over the paper industry the last thirty years, owing to the introduction of chemically prepared wood pulp. In 1882 the first sulphite was produced in the United States, and as soon as the success of the process became established, and paper made with this new raw material had proved itself suitable for the printing of books, all developments involving the erection of complete new mills naturally sought locations adjacent to the standing timber.

In the course of years the mill at Groton became rather obsolete, as did the Eagle Mill at Milton, so it was wisely decided to dispose of these properties and to centralize the production at the modern mill at Hyde Park. Therefore, those properties, together with the old sites of Gillespie and the Fuller Mills, which had long been abandoned for paper-making purposes, and were not conveniently located for use by the Company, were gradually disposed of to advantage. At the same time the equipment at Hyde Park has been constantly renewed and improved, so that its increased efficiency results today in a larger output than all three mills in 1900, besides offering the

advantages of centralizing the activities in a single plant.

It is worthy of special mention that the Tileston & Hollingsworth Company has continued to operate a paper mill situated within the limits of what is now the City of Boston, although the paper-making industry generally, because of changing conditions, has been obliged literally to take to the woods. Because of the Tileston & Hollingsworth Company's affiliation with the Penobscot Chemical Fibre Company, it is assured of its supplies of soda fibre and sulphite fibre, which together with its own equipment for using rags, allows it to fill almost any specification as to the manufacture of paper which its customers may require. This, coupled with its policy of selling direct to the consumer in New England, is accountable in a large degree for the present success of the Company.

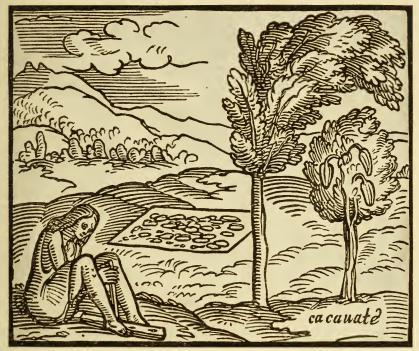
The officers of the Company now are: Amor Hollingsworth, President; E. H. Clapp, Treasurer; A. V. Howland, Vice-President and

Assistant Treasurer.

Quality rather than quantity, is the watchword today as it was with previous generations. The Tileston & Hollingsworth Company is now in its one hundred and twenty-second year as a corporate entity, though it really reaches back, as has been shown by this narrative, to the pioneer paper mill of New England, which was authorized by legislative sanction one hundred and ninety-two years ago.

WALTER BAKER & CO., LTD.

The attractive pamphlet of the Walter Baker Company furnishes a delightful evening's reading, and among the interesting bits of information about the raising of the cacao nuts and their manufacture, one learns that for three centuries it has been customary to plant a large sheltering tree to shade the young cacao tree, as shown



From an old drawing

Kindness of H. C. Gallagher

The first reference to the cacao tree and its products was in the accounts of the explorers who followed Columbus. This engraving represents the native method of procuring fire by rapidly twirling a pointed stick in a groove of a piece of wood placed on the ground. The tree on the right has comparatively large fruits and pods borne on the main stem. This might be thought at first to be an error of the artist, but it is in fact a rude expression of one of the most remarkable peculiarities of the plant. The engraving shows that the cacao tree is sheltered by a larger tree of some kind near it. This practice of planting a sheltering tree to shade the young cacao tree for a time is still kept up wherever the plant is successfully cultivated.

in a reproduction of an old engraving. One of the first references to the cacao tree is found in the accounts of the explorers who followed Columbus. Another fact of importance is that in the time of King Charles the price of the best chocolate was six shillings eightpence a pound, which, considering the greater purchasing price of money at that time, would equal about five dollars a pound now for an inferior grade. The compiler of this interesting information then goes on to explain that the principal importations of crude cocoa into this country came from the British West Indies, Dominican Republic, Brazil and Ecuador, and that the estimated consumption in Europe at the present time is over 225,000,000 pounds. No trees can be made to grow either in North America or Europe. The word "cocoa" seems to have been a corruption of the term "cacao," but it is used almost universally at the present time in the English-speaking countries, while the name of the



From a model

Kindness of H. C. Gallagher

MILTON LOWER MILLS IN 1822 Showing Walter Baker & Co. mill on the right.

finished article, "chocolate," is taken from the Mexican word "chocolatl," or "cacahuatl," meaning "drink." The last syllable, "atl," in Mexican signifies "water," but the meaning of the first part of the word is not so clear. A French writer declares it implies noise, and that the concoction was so called on account of the sound made

when being beaten to a froth before being drunk.

It is said that the Spaniards found the Mexicans using chocolate as early as the time of Cortez in 1519, and that the Spaniards at once introduced it into their country. From Spain, Anne of Austria, daughter of Philip III and Queen of Louis XIII, brought the beverage to France, while the Spanish monks also spread to that country the knowledge of the article by constant presents. Linnæus called the fruit of the tree "theobroma," meaning "food for the gods." It is said, too, that the Spanish ladies were so fond of chocolate that they sometimes had it carried after them to church, an act which was reproved often by the bishops. One reverend father by the name of Escobar, however, declared that a fast was not broken by chocolate prepared with water.

Chocolate also appears to have been used often as a medical remedy by the leading physicians of that day; Christopher Ludwig Hoffmann, for instance, wrote a treatise entitled "Potus Chocolate," in which he recommended it in many diseases, stating that Cardinal Richelieu

was cured by its use.

The first intimation of its introduction into England is found in the *Public Advertiser* of Tuesday, June 16, 1657, announcing that "in Bishopsgate Street, in Queen's Head Alley, at a Frenchman's house, is an excellent West India drink, called chocolate, to be sold, where you may have it ready at any time; and also unmade, at reasonable rates."

Two years later, in the *Mercurius Politicus* for June, 1659, it is stated that "chocolate, an excellent West India drink, is sold in Queen's Head Alley, in Bishopsgate Street, by a Frenchman who did formerly sell it in Grace Church Street and Clement's Churchyard, being the first man who did sell it in England; and its virtues are highly extolled."

Chocolate had become such a favorite drink that Alexander Pope, in

his "Rape of the Lock," wrote that

"In fumes of burning chocolate shall glow, And tremble at the sea that froths below."



From a photograph

Kindness of H. C. Gallagher

RARE LABEL BY JOHN HANNON, SAID TO BE THE FIRST CHOCOLATE LABEL USED IN AMERICA

John Hannon's plant was the first mill of this kind in this country and was situated on the present site of the Walter Baker & Co., Ltd., at Dorchester Lower Mills, Massachusetts.

The Mexicans not only used the article for food, but also made use of the seeds of the cacao tree as a medium of exchange. An early writer says: "In certain provinces called Guatimala and Soconusco there is growing a great store of cacao, which is a berry like unto an almond. It is the best merchandise that is in all the Indies. The Indians make drink of it, and in like manner meat to eat. It goeth currently for money in any market, or fair, and may buy flesh, fish, bread or cheese, or other things." Cacao was also employed as currency among the natives of Central and South America, at the time of the European conquest, although there was a plentiful supply of gold at that time. Joseph Acosta tells us the Indians used "none of their gold or silver for traffic in or by withall and unto this day the custom continues among them that instead of money they use cocoa." The Aztecs of ancient Mexico also used "cocoa" as small change, as many as eight thousand beans being counted legal tender. The value of the beans may be judged from the fact that a "tolerably good slave" could be purchased for one hundred of them.

It is impossible for the many tourists and residents of the South Shore to pass through Dorchester Lower Mills without being made to realize by the delicious fragrance of the chocolate that there, with part of the mills in Dorchester and part in Milton in a locality usually known as Milton Lower Mills, is the wonderful plant of the Walter Baker Company. There was manufactured the first chocolate ever



From a drawing

Kindness of H. C. Gallagher

OLD STONE MILL OF WALTER BAKER & CO., ERECTED IN 1849 AT DORCHESTER LOWER MILLS, MASSACHUSETTS

This building was on the site of the original mill, part of which was used in 1765 by John Hannon (present site of Baker Mill and Refrigerating Plant).

made in this country, in the year 1765, in a small mill, the first of its kind to be erected in North America. It was connected with a saw-mill, operated by water power, and was at that time regarded as a somewhat doubtful experiment. Its establishment was due to the representations made by John Hannon, an Irish immigrant, who had learned the business of chocolate-making in England. A picture of one of his advertisements, said to be the first chocolate label used in America, is included. James Boies became interested in Hannon and finally induced Edward Wentworth and Henry Stone, who were at that time building a new mill near the old powder mill, to manufacture chocolate in their building. The new industry prospered in a small way, and on the death of Hannon, in 1780, Dr. James Baker established the house which was continued under the name of Baker without interruption from that day to this.

Five years later, the first notice of the sale of cocoa and chocolate in this country appears in the Boston Gazette and Country Journal

under date of March 12th:-

"To be sold by JOHN BAKER

At his store in Back Street a few Bags of the best Cocoa; also choice Chocolate by the Hundred or Smaller Quantity."

After the death of Dr. James Baker the business fell in the order of succession to his son Edmund and his grandson Walter. On the

death of the latter, in 1852, Sidney Williams, who had been his partner for some years, continued in charge of the affairs until he died two years later (1854), when Henry L. Pierce, a relative of Walter Baker and one of the best-known citizens of Milton, took the management of the business, first as lessee and later as sole owner. During the forty-two years in which he had control he raised it from a comparatively small, local concern to the position of the leading industrial enterprise of its kind in the world.

In 1895 the business was organized as a corporation under the general laws of Massachusetts, and in 1898 a special charter was

granted by the General Court.

This old stone mill already mentioned, which was erected in 1849 on the site long occupied by the small building shown in the engraving of 1822, has given place to an imposing structure of brick and stone, known as Mill No. 5. The plant now comprises six mills on the Dorchester and Milton sides of the Neponset River, containing over

fourteen acres floor space.

On the site of this old stone chocolate mill on the Milton side of the river was erected in 1634 the first grist mill which ground the first corn by water power in New England. This mill later became the property of Mr. Samuel Gannett, one of the well-known residents of Milton. Near here also was built, in 1675, by Thomas Thacher, Humphrey Davis and John Wiswall the first powder mill erected in this country. This mill blew up about the year 1744, killing all the workmen there. A tablet was prepared at one time to be placed on the mill building on Eliot Street, but owing to conflicting historical critics as to the exact site it was never set up.

The Walter Baker Company, represented by the trade-mark reproduced from Liotard's famous painting of "La Belle Chocolatière," is known throughout the world as representing the best product that a

chocolate mill can produce.

THE WALTHAM BLEACHERY AND DYE WORKS

The Waltham Bleachery and Dye Works was started in 1820 as a part of the Boston Manufacturing Company, which was established in the year 1813, and was the first attempt at bleaching cotton goods made in the country with the exception of one small bleachery in Providence, Rhode Island, that had been in operation but a short time. It was projected and put in operation under the direction of the late Patrick T. Jackson, whose name is so intimately and honorably connected with the early history of cotton manufacturing in this country. The property was originally owned by the Waltham Cotton and Wool Factory Company and was bought by the Boston Manufacturing Company in February 1819.

On the first day of April, 1819, an agreement was entered into with Eben Hobbs, Jr., of Waltham, one paragraph of which is worded as follows: "And in consideration of the promise the said company do hereby agree that they will pay to said E. Hobbs, Jr., a salary, at the



From an old woodcut

Kindness of Ronald T. Lyman

VIEW OF THE WALTHAM BLEACHERY IN 1853, WITH THE CHARLES RIVER IN THE FOREGROUND

This establishment, erected in 1820, with the exception of one in Providence, Rhode Island, which had then been in operation for only a short time, was the first in this country to attempt the bleaching of cotton goods.

rate of \$800 per annum, to be paid quarter yearly, and to find him a house to live in, as good as the house lately occupied by Abiel Lovejoy

with the grounds attached to it in Waltham, free of rent."

The Boston Manufacturing Company bought the land along the river between the "upper" and "lower" places, as they were then called, and laid out River Street to connect the two, the capital of the Boston Manufacturing Company being increased from \$400,000 to \$600,000 at this time, presumably to enable them to finance the cost of land, buildings and machinery for the new plant.

In 1868 the manufacture of hosiery was begun and continued for several years, knit underwear being added later; but after several

years' experience this feature was abandoned.

In 1901 it was decided to separate the Bleachery from the Cotton Mill and have two corporations. The Waltham Bleachery and Dye Works was accordingly incorporated with a capital of \$480,000, which was reduced to \$400,000 in the course of two or three years and increased to \$600,000 in March, 1922, by the issue of a fifty per cent. stock dividend.

Since its incorporation as a separate concern, the Company has been very successful and has paid dividends averaging 11.59 per cent.

in the last eleven years.

The pictures of some of the old prints of the Bleachery are especially attractive.





From old woodcuts

Kindness of Ronald T. Lyman

INTERIORS OF WALTHAM BLEACHERY IN 1853

The picture on the left shows the boiling-room of the Waltham Bleachery in 1853. Arranged on each side were large kiers in which the cloth was boiled and thus cleansed of any dirt or vegetable oils, after which the cloth passed into the washroom, shown above on the right, where it was thoroughly bleached and then washed by passing through various machines.

WALWORTH MANUFACTURING COMPANY

Nearly twenty years before the Civil War, when the use of steam was in its infancy, the business that eventually became the Walworth Manufacturing Company was first started by two men, James Jones Walworth and Joseph Nason, who, to use the words of the Company, "agreed to risk their money and their future upon a scheme for installing a new heating device in business houses and residences."

Walworth was born in Canaan, New Hampshire, and found work in a hardware store in Boston. In 1837 he married the daughter of the man

who was later to become his partner in this new enterprise.

Nason went abroad in 1841, where he met Angier M. Perkins, who was then experimenting with a device for warming houses by the use of hot water carried in iron pipes. Perkins was credited with having perfected the first hot-water heating system in England and in this idea Nason saw such possibilities that he purchased a considerable amount of pipe in order to introduce this housewarming plan into America.

The partnership was formed in New York, and a year later it was decided that Boston was a better location for their business. In 1842 they purchased a building in the centre of Boston, which plant proved

inadequate, it being then decided to erect a larger factory on Northamp-

ton Street in Edgeworth, near Malden.

In 1847 James Walworth went to England, where he visited the pipe mills of James Russell & Sons, supposed to be the first manufacturers of wrought iron pipe in the world, and on his return he engaged the services of Robert Briggs, the originator of the Briggs standard of pipe threads which is still in use, forming the Wanalancet Tube Company with a new mill at Edgeworth. The first pipe from this plant was made in 1849.

In 1844 the firm of Walworth & Nason conceived the idea of warming houses with the use of steam, whereupon a steam-heating system was installed in a large woolen manufacturing house in Boston, the plan turning out to be so satisfactory that it marked a new era in American industry. Although their partnership had been formed to warm buildings by means of steam apparatus, it was not at that time the idea

of actually using the steam, but merely the apparatus.

C. W. Ernst, the author of the history of Suffolk County, wrote of this feat in 1893, "From this . . . has grown an industry of immense proportions represented by numerous establishments in nearly every state in the union, as well as in many foreign lands, involving an aggregate capital of \$50,000,000 or \$60,000,000 and employing more than 1,000,000 workmen in this country alone." Today this number of workers is probably doubled.

This steam-heating industry was carried on by the firm for the next thirty years, during which time it installed plants and buildings throughout the eastern part of Massachusetts, hundreds of steam fitters receiving their diplomas from the firm. In fact, so many heating plants did the firm manufacture, that in the early 70's it was a byword of the trade that "if you scratch any steam fitter deep enough you will

find the name of Walworth somewhere beneath his skin.'

The chief difficulty in those early days was in procuring fittings for pipes, which necessitated the making of their own fittings. In 1852 Nason went to New York to live, as he did not like the east winds and the severe winters in Boston. His partner, however, continued business as J. J. Walworth & Company, the "Company" represented by M. S. Scudder and C. C. Walworth, the latter a brother of the founder of the firm. In the late 50's this firm established the manufacturing plant in Cambridgeport in order to increase the output of fittings.

J. J. Walworth also originated and developed a ventilator for public buildings, which was manufactured exclusively by the Walworth Manufacturing Company for many years. The Stillson wrench was also

another invention of the Company.

It is particularly interesting to mention that the first reciprocal telephone conversation which ever took place was over the telegraph line owned by the Walworth Manufacturing Company, extending from their office on Kilby Street, Boston, to their factories in Cambridgeport, a distance of two miles. The print, as shown in the frontispiece, shows the Walworth Manufacturing plant as it was at that time.

The Walworth Manufacturing Company was the outcome of the

old firm, being incorporated in 1872 with J. J. Walworth, President, Marshall S. Scudder, Vice-President, and C. C. Walworth, Manager of the Mechanical Department, the purpose of the Company being to manufacture and sell steam-heating apparatus, gas and water pipes and fittings, pumps, valves, gas engines and tools.

The assistance of Mr. C. C. Walworth during the years of business

The assistance of Mr. C. C. Walworth during the years of business depression was exceedingly valuable, and it was undoubtedly due to him that the Company survived. The Company in the 80's increased to such an extent that the directors decided to purchase their property

in South Boston.

An interesting feature of the Company's business occurred in the early 70's, for at that time it engaged in the business of making gaslighting plants for private residences and buildings, and at one time nearly every railroad station and many hotels were provided with this apparatus.

In 1894 C. C. Walworth, at the age of eighty, died, whereupon his son-in-law, the late Wallace L. Pierce, so prominent in the business life of Boston, was chosen President, remaining a director until a year

before his death in 1920.

During the last part of the century the Walworth Manufacturing Company concentrated upon the manufacture of fittings, valves and tools, adding also an automatic sprinkler, which was sold some years later.

In 1912 the directors of the Company decided to enlarge the business and fortunately were able to induce Howard Coonley, who married a grand-daughter of C. C. Walworth, to come from Chicago to become President of this New England industry. Associated with him are Theodore W. Little and W. P. F. Ayer and others whose aim has been to broaden the market for the sale of their fittings. Branches were soon started in New York, Chicago, Philadelphia and Seattle, as well as agencies in Havana, Cuba; Buenos Ayres, Argentina; Sao Paulo, Brazil; Santiago, Chile; Sydney, Australia, and Mexico City, Mexico. Connections have also been made for their goods in England, France and other countries, including China, Japan, India, South Africa and Australia, so that today the Company is sending its wares to almost every civilized country on the globe.

WAMSUTTA MILLS

A history of our New England industries would not be complete without including the Wamsutta Mills of New Bedford, which were the first cotton mills to be established in that city. The formation of the Company has always been considered an "isolated venture" for the reason that it was twenty years before the next cotton mill was erected there. The most interesting thing in connection with the building of the mill is the fact that the necessary interest was created and the capital raised at a time when the whaling industry was prosperous and when the people of New Bedford were investing their money chiefly in this or kindred industries. It was, therefore, difficult



From a drawing

Kindness of C. F. Broughton

THE FIRST OF THE BUILDINGS OF THE WAMSUTTA MILLS, ERECTED IN NEW BEDFORD IN 1847

This company was the pioneer cotton mill in that city, antedating all other mills of the kind by twenty years. The company was the only cotton mill that was started during the height of the whaling industry.

to interest investors in a stock company outside of whaling. Furthermore, the profits in this pursuit had been large and fairly certain and the sentiments of those who had money to invest was in favor of individual ventures, and corporations were regarded with disfavor and suspicion. In addition to this the mechanics considered the hours and discipline of mill work as inimical to their own interests. Nevertheless these obstacles were not allowed to dampen the courage of the men who had set their minds on forming the new enterprise. Of course the pessimist predicted ruin, but the mill was successful from the start.

It is interesting to mention that when Thomas Bennett, Jr., first tried to interest Joseph Grinnell in the building of the mill, the latter thought it advisable to establish the plant somewhere in the South. Grinnell had had experience in a mill there, but was convinced that a cotton plant in the North might also be successful. "Why not locate the mill in New Bedford?" he said, and finally insisted that if he were to aid in the plan the Wamsutta Mills should be located in this flourishing New England city.

In 1846, Hon. Abraham H. Howland obtained from the legislature of Massachusetts by special act a charter for a manufacturing company, to be located in New Bedford "for the manufacture of cotton, wool or iron," to be called the Wamsutta Mills. The mill was very appropriately named after Wamsutta, elder son of Massasoit, Chief of the Wampanoags, who at the death of his father came into power

as the great Sachem of the Wampanoags for these territories, and from whom all of the land now comprising New Bedford and surrounding districts was purchased. The names mentioned in the charter were Jireh Perry, Matthew Luce, Thomas S. Hathaway and their associates. Hon. Joseph Grinnell headed the subscription list with \$10,000, and other stockholders were obtained to the amount of \$160,000. The first stockholders' meeting was held on June 9, 1847, Mr. Grinnell presiding and Thomas Bennett, Jr., acting as secretary. At this meeting the charter was accepted and the company organized with officers as follows: Joseph Grinnell, President; Edward L. Baker, Treasurer and Clerk. The Directors were Joseph Grinnell, David R. Greene, Thomas Mandell, Pardon Tillinghast and Joseph C. Delano. Mr. Bennett was appointed agent, serving in this capacity for twenty-seven years, Edward Kilburn then becoming his successor.

On January 1, 1849, the machinery was started, and the well-known Wamsutta shirting was manufactured, which is still a leading product of these mills. Later on, the manufacture of sheeting was undertaken, and today the Wamsutta Percale sheets are known throughout the world. It was claimed that the quality of this material was so superior that the sheets made at the mill twenty-five or thirty years ago are still found doing service in the homes of New England. In fact, the sheeting retained its quality for so long that the name "Wamsutta" has now found its way into the Century Dictionary, which defines it

as follows:-

"wamsutta (wom-sut ä), n. Cotton cloth made at the Wamsutta Mills, New Bedford, Massachusetts."

Other finished products include Wamsutta Cambric, Nainsook, Longcloth, Lawns, Lustersheers, Lingeries; also, Sailcloths and Yacht Ducks for light sails.

Gray goods for the converting trade include Oxfords, Poplins,

Fancies and Special Fabrics up to 150 inches in width.

A large business is also carried on in Combed Yarns.

The greatest care is exercised in the selection of the cotton, a great deal of which is called "Benders" because it comes from the bends in the Mississippi River, where the soil produces a particularly strong staple.

The second mill was built in 1853, and the plant has continued to grow until now it comprises eight mills with 226,000 spindles and 3400 looms, as well as a Sheet and Pillowcase Factory. The capital

has also steadily increased until it now stands at \$6,000,000.

There have been so few changes in the officers in these many years, that we here append a list of them:—

Presidents: Joseph Grinnell, 1847-1885; Andrew G. Pierce, 1885-1889; Wil-

liam W. Crapo, 1889-1918; Oliver Prescott, 1918-

Treasurers: Edward L. Baker, 1847-1855; Andrew G. Pierce, 1855-1897; Edward T. Pierce, 1897-1916; Andrew Raeburn, 1916-1919; C. F. Broughton, 1919-

William J. Kent, 1888–1897; Herbert E. Walmsley, 1897–1914; Harry Tunstall, 1915–1916; N. A. Batchelder, 1917–1918; Charles Morton, 1919–1920; A. L. Emery, 1920–

Wamsutta Sheets and Pillowcases, Fancies, Finished Goods and Special Fabrics are sold by Ridley Watts & Co. Plain Gray Goods sold direct. Yarns sold direct and by R. A. Blythe, Inc., Philadelphia, Pa.

It has been demonstrated that there is a certain humidity in the atmosphere at New Bedford that is very favorable to the spinning of fine yarns. In the city are over 3,500,000 spindles, and as regards the manufacture of fine goods, New Bedford ranks first in this country. Another fact of interest is that the population of New Bedford has risen from 20,000 in the days of whaling to over 130,000 at the present time; the great cotton mills of New Bedford have risen to take the place of the whaling industry and have continued to make the name of the city as well known throughout the world as it was a century ago.

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